

An Advance Campaign for the Fourth Liberty Loan You Can Help (See Pages 34-35).

UNIV. OF MICH.

Railway Age

SECOND HALF OF 1918—No. 11

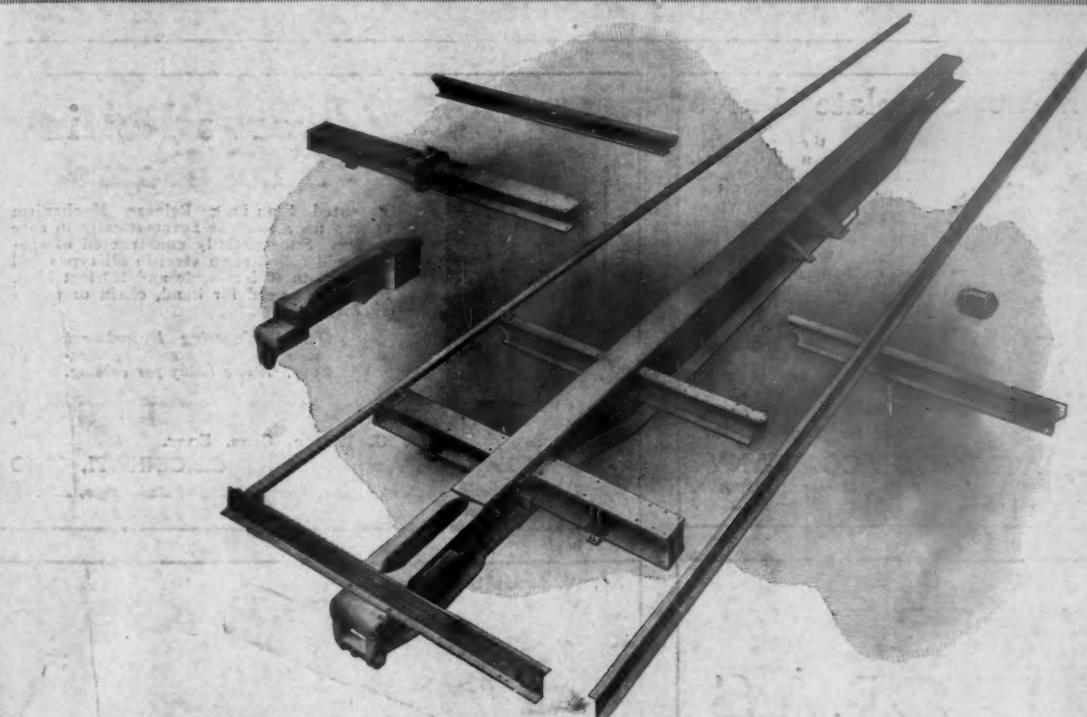
SIXTY-THIRD YEAR

NEW YORK: WOOLWORTH BLDG.
CHICAGO: Transportation Bldg.

NEW YORK—SEPTEMBER 13, 1918—CHICAGO

WASHINGTON: Home Life Bldg.
CLEVELAND: Citizens Bldg.

Entered as second-class matter at the post office at New York, N. Y., under the act of March 3, 1879.
Published weekly. Subscription Price, United States and Mexico, \$5.00 a year; Canada, \$6.00; foreign countries (excepting daily editions), \$8.00.



BETTENDORF

Eliminated
The
Thousands
Expensive
Non-essential
Details
Otherwise
Regularly
Found.

The Bettendorf Company

Offices and Works
BETTENDORF, IOWA



The long-wearing, rich-appearing upholstery material—inexpensive and distinctive.

L. C. CHASE & CO., Boston
NEW YORK DETROIT CHICAGO

The standard upholstery for over a third of a century—grades for all uses.

CHASE
Goat Brand
Car Plush



**IS YOUR HEATING MAINTENANCE CHARGE HIGH?
WHY NOT APPLY A SYSTEM THAT WILL CUT THIS IN HALF?**

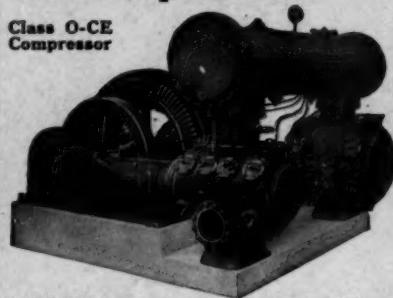
Gold's Thermostatic Control System Saves 50% in Steam Consumption,
Uses Less Pipe and Fittings—Positively Gives a Uniform Temperature.

Thermostatic Control Can Be Applied to Your Existing Systems

GOLD CAR HEATING & LIGHTING CO., 17 Battery Pl., New York

Chicago Pneumatic Simplate Valve Air Compressors

Class O-CE
Compressor



represent the most advanced design in duplex, high speed, inclosed frame, self-oiling machines of their type. Smoothness and Noiselessness of operation are two of their principal features. Their volumetric and mechanical efficiencies are the maximum.

All Chicago Pneumatic air compressors are equipped with Simplate valves, which have made high speeds safely practicable, and which are practically indestructible.

Send for Bulletin 34-M.

CHICAGO PNEUMATIC TOOL COMPANY

1824 Fisher Building
Chicago

52 Vanderbilt Ave.
New York 3

Branches Everywhere.



Edwards Rolling Steel Doors

Patented Spring Release Mechanism causes door to close automatically in case of fire. Substantially constructed of special cold rolled strip steel in all types and sizes up to 40 feet wide and 100 feet high. Spring balanced for hand, chain or power operation.

Our Engineering Department will submit plans and specifications. Write today for catalog.

THE EDWARDS MANUFACTURING CO.

Lester G. Wilson, Cons. Engr.

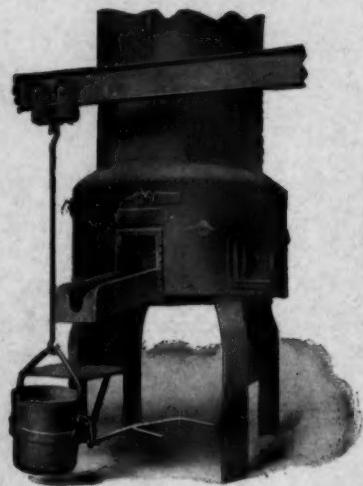
438-488 Eggleston Avenue

CINCINNATI, OHIO

Steel Lockers, Shelving Bins, Portable Steel Buildings, Etc.

WHITING CUPOLAS

The Logical Iron Melter



Over 3,000 Sold

There's a Reason

Write for Catalog Giving Capacities and Complete Information

Standard Cupola

Complete Foundry Equipment

WHITING
FOUNDRY EQUIPMENT CO.
HARVEY-ILL. U.S.A.
CHICAGO SUBURB

Cranes of All Types

No. 3S, Little David Chipper



“LITTLE DAVID”

A PNEUMATIC TOOL FOR EVERY SERVICE

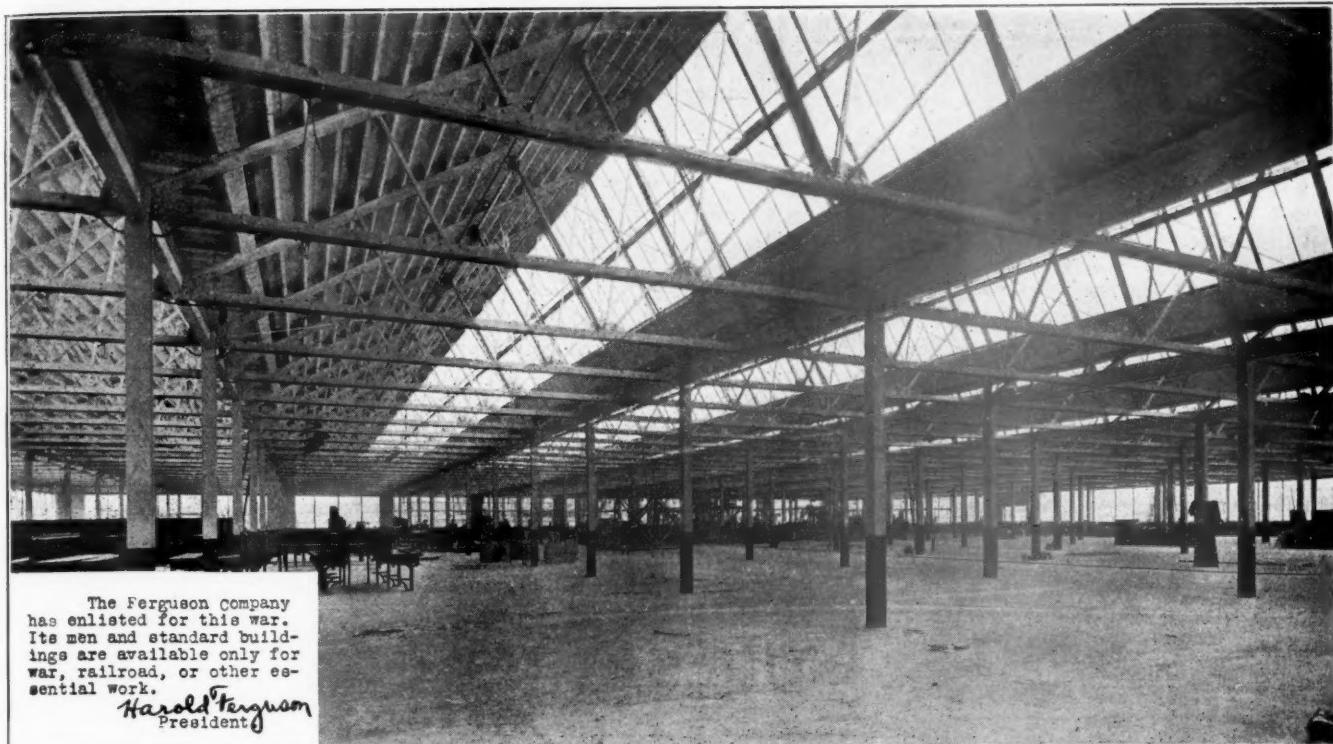
Each marked by a large work capacity, minimum number of parts, and great durability.

Ask for Complete Catalog

INGERSOLL-RAND COMPANY
11 Broadway, New York



24-PT



Every inch of Sawtooth floor space is uniformly lighted, ready for useful occupancy.

All Daylight---Fine Ventilation--- No Waste Space---Expand Any Way

THE advantages of Sawtooth Buildings are very real.

- (1) They are uniformly daylighted throughout—no direct sunlight and no waste floor space.
- (2) They can be expanded laterally in any direction with equal facility—grow any time with no waste ground area.
- (3) They are excellently ventilated by means of top hung sash in each "sawtooth"—lots of fresh air.
- (4) They cover large areas quickly with all the above advantages, for less structural steel per square foot than any other accepted type of modern industrial construction. Their economy is assured.

THE FERGUSON ENGINEERING DEPARTMENT helps to lay out machinery and equipment in standard or special buildings. Their work includes plumbing, heating, lighting and mechanical and electrical facilities.

FERGUSON Engineers pay special attention to the improvement and alteration of existing buildings and machinery to give increased production at low cost.

Now is a good time to get familiar with the advantages of a FERGUSON Engineering contract.

*For further details as to Ferguson Engineering or Building Contracts
phone, wire or write*

The Ferguson Company

Main Office 6523 Euclid Ave. CLEVELAND Telephone Rosedale 6854



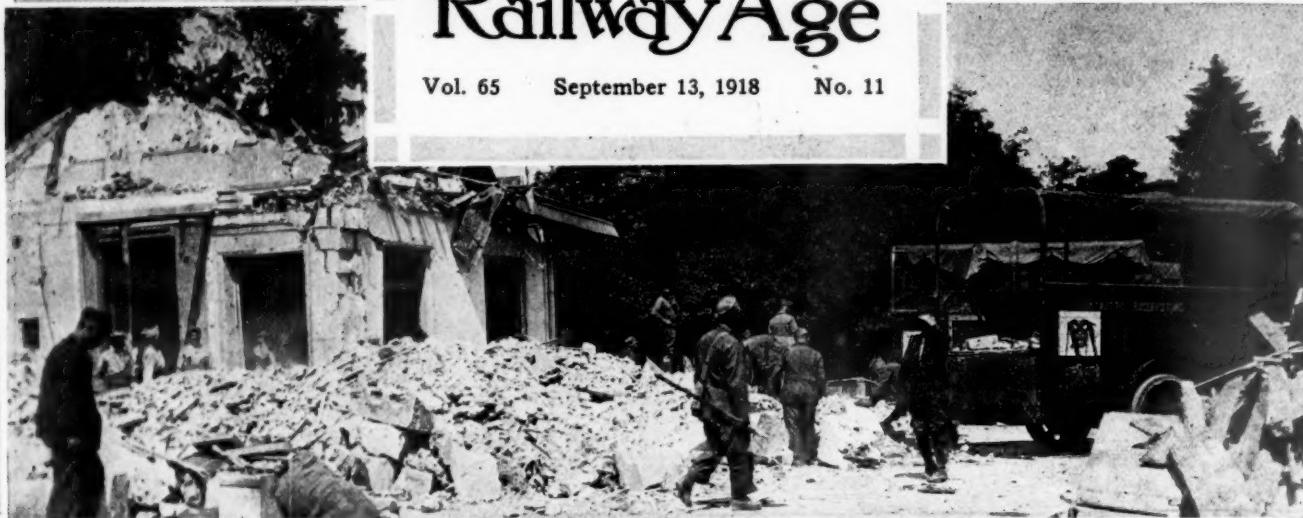
**FERGUSON
ORIGINATED
STANDARD
FACTORIES**

Ferguson

GOOD BUILDINGS - QUICKLY - AT LOW COST

Railway Age

Vol. 65 September 13, 1918 No. 11



A Destroyed Railroad Station in the Wake of the German Retreat. Photo Copyright by Press Illustrating Service

Contents

Director General McAdoo Reports to President Page 477

Mr. McAdoo in a Long Report Issued Monday Tells What the Railroad Administration Has Done in the Seven Months to Date.

Railway Executives' Advisory Committee Report 485

This Committee in a Report Signed by Thomas DeWitt Cuyler Reviews the Discussion Over the Compensation Contract and Advises the Acceptance of the Latter.

Report of Traveling Engineers' Association Convention 494

The Necessity and Importance of Fuel Conservation and Its Effect Upon the Winning of the War Was Emphasized. Large Attendance of Members.

EDITORIALS

Railway Men and the Liberty Loan.....	467
How to Pick Real Leaders.....	467
"Travel Slacker" a Strong Name.....	467
The Advisory Committee's Standing.....	467
An Explanation of Intent Necessary.....	468
Seven Months of Government Control.....	468
The Compensation Contract.....	469
Chicago, Rock Island & Pacific.....	470
NEW BOOKS	472

GENERAL ARTICLES

Strengthening Poughkeepsie Bridge Superstructure.....	473
Director General McAdoo Reports to President.....	477

GENERAL ARTICLES—Continued

N. W. Region; a Group of Well-Managed Roads.....	483
Railway Executives' Advisory Committee Report.....	485
Employers Asked to Co-operate in Selective Draft.....	488
Valuation Report on the Winston-Salem Southbound.....	489
Efficiency in the Handling of Railway Supplies; by Charles E. Parks	491
Modification of Contingent Fee Warranty.....	493
Report of Traveling Engineers' Association Convention.....	494
Fuel Conservation at Stationary Plants.....	508
Doings of United States Railroad Administration.....	510
Orders of Regional Directors.....	518
Electric Snow Melting Device.....	520
GENERAL NEWS SECTION	521

Alphabetical Index to Advertisements, page 5. Directory of Advertisers, page 6.

Published every Friday and daily eight times in June by the

Simmons-Boardman Publishing Company, Woolworth Building, New York

EDWARD A. SIMMONS, Pres. L. B. SHERMAN, Vice-Pres. HENRY LEE, Vice-Pres. & Treas. M. H. WIUM, Secretary.
CHICAGO: Transportation Building. CLEVELAND: Citizens Building. WASHINGTON: Home Life Building.

Editorial Staff

SAMUEL O. DUNN, Editor.
ROY V. WRIGHT, Managing Editor.

W. E. HOOPER	C. B. PECK	K. E. KELLENBERGER
E. T. HOWSON	W. S. LACHER	F. W. KRAEGER
B. B. ADAMS	J. G. LITTLE	G. L. LACHER
H. F. LANE	A. F. STUEBING	B. W. MEISEL
R. E. THAYER	C. W. FOSS	

Entered at the Post Office at New York, N. Y., as mail matter
of the second class.

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States and Mexico, \$5.00; Canada, \$6.00; Foreign Countries (excluding daily editions), \$8.00; single copies, 15 cents each.

WE GUARANTEE, that of this issue 7,650 copies were printed; that of these 7,650 copies 6,908 were mailed to regular paid subscribers, 172 were provided for counter and news companies' sales, 299 were mailed to advertisers, 142 were mailed to exchanges and correspondents, and 129 were provided for new subscriptions, samples, copies lost in the mail and office use; that the total copies printed this year to date were 331,217, an average of 8,952 copies a week.

EDITORIAL

Railway Age

In the first Liberty Loan campaign the railway men of this country subscribed for bonds on a good scale, in the second loan they doubled their first totals and in the third they considerably more than doubled their totals for the second loan.

Railway Men and the Liberty Loan

Are they going to keep up this enviable record and double their third totals in the next loan? It looks easy. The Liberty Loan Committee for the Seventh Federal Reserve District (Chicago) has made a detailed compilation showing the Liberty Bond subscriptions of the 450,000 railroad men in that district. In the first loan 11 per cent of the employees subscribed for an average of \$92.50 per subscriber; in the second, 20 per cent for an average of \$82.50; in the third, 84 per cent for an average of \$72. On this basis there should be for the fourth loan 100 per cent for an average of \$60 per subscriber. An average of \$60 per railroad man is going to look pretty low in view of the recent generous wage awards. A well directed campaign should greatly increase this figure.

A prominent manufacturer who has studied hundreds of industrial plants, recently made this observation—that the greatest weakness in the different organizations is that the foremen have been selected more for their technical knowledge and ability to carry out orders, than for their ability to understand and direct men.

How to Pick Real Leaders

The railroads are no better off in this respect than industrial organizations, whether it be in the office, on the road, in the shops, or in the yards. True there are many natural executives and real leaders among railroad officers and foremen, but the necessity for training men to develop latent ability in this respect has been largely overlooked, and yet the science of handling men, of understanding human relationships and human nature is just as real and concrete as the science of mathematics, and is of far greater importance than technical knowledge, when it comes to securing output and harmonious relationships. No matter how good the mechanical machine for playing a musical instrument may be, it will fall far short of the touch of a master hand. Men cannot be handled mechanically, or by rules and regulations. They require the direction of a master hand who understands their feelings, their ways of thinking and living, and their ambitions—and who has a keen sympathy with them. This is the type of men that the railroads must select, train and develop for positions of leadership.

If we are to judge by conditions in England, higher passenger fares and inconveniences in transportation alone will not go for towards reducing passenger traffic on the railroads. In England, in spite of an increase in fares of 50 per cent at one time and with very drastic reductions in service, the number of persons

presenting themselves for journeys is still exceedingly large. During the recent Bank Holiday the British railways handled a more intensive passenger traffic than they have ever carried at any previous period in their history. This will emphasize

that the increase to 3 or 3½ cents a mile that we have had in this country, combined with the comparatively minor inconveniences that American passengers have in the way of busy central ticket offices and lack of seats, will not go far towards reducing passenger traffic. The Railroad Administration has not had much to say as yet about the inadvisability of traveling unnecessarily. We would suggest that in its efforts to retain the satisfaction of the traveling public, it amplify the statements of the director general and his actuary, Mr. Price, and possibly start a campaign of publicity emphasizing more strongly and more generally the necessity of not traveling unnecessarily. It is going a bit too far to begin to talk about "travel slackers"—the public press has in instances adopted the term—when two-thirds of the people of the country do not yet know that they might better keep off the trains except on necessary errands. Surely a campaign against unnecessary travel will do far more than merely making travel inconvenient. A passenger will complain at higher fares and get up a grouch if he has to stand on a train or in line at a too busy ticket office, but he will travel, nevertheless. And a grouch against government operation of railways, if we understand aright, is not one of the things desired by the Railroad Administration. Better that a prospective passenger should be strongly advised to stay at home and save his grouch for the cohorts of Kaiser Bill the Damned.

For a full appreciation of the significance of the Railway Executives Advisory Committee's recommendations and an

The Advisory Committee's Standing

appreciation of the limitation of its authority, it is necessary to understand just what the committee is. It is supported by 82 railways, representing 90 per cent of the railroad mileage of the United States. All of the important railroads of the country, with the exception of the Southern Railway, contribute to its support. As such, it is easy to understand how great weight its recommendations will carry. On the other hand, it has no authority whatsoever to bind its members or the roads represented by its members to any course of action. The recommendations which the committee has made that the contract, as finally approved by the director general, shall be accepted, can only be laid before the boards of directors of the respective roads, passed on by them and referred to the stockholders for their approval. If, therefore, the recommendations of the National Association of Owners of Railroad Securities really represents the sentiment of a majority of the stockholders of any of the larger roads, it will be perfectly possible for the individual companies to refuse to ratify the recommendations of the Advisory Committee; but before taking any such step as that, the stockholders ought to be fully informed by their boards of directors as to the extent and quality of the work which has gone into the negotiation between the Advisory Committee and the Railroad Administration. This committee has been at work since January, 1918. It is hard to exaggerate the amount of patience required to conduct such a long drawn out negotiation with the government, especially when both sides to the negotiation were fully aware of the overwhelming advantage which the government had. It was only through the slow process of convincing the railroad administration

that simple justice not only for stockholders of railroads, but for all of those directly or indirectly affected by railroad credit, necessitated a particular change in the contract that the advisory committee could move the government from its original purpose. The weight which the report should carry must be measured, therefore, not by the authority which the committee has, but by the ability of its members and the quality of the work which they have put into these negotiations.

A situation which is causing much concern to railway officers has resulted from the different interpretations that may

**An Explanation
of Intent
Necessary**

be made of Supplement No. 4 to Order 27 providing for additional increases in the wages of employees of the mechanical department. Under Section 5, Article 1, of this supplement specific mention is made of cable splicers, linemen and groundmen, signalmen and signal maintainers, where handling wires and apparatus carrying 240 volts or over or in dense traffic zones and all other work properly recognized as first-class electrical workers work. This has been interpreted literally by certain railways, and increases have been granted to employees not usually considered as mechanical department employees. The introduction to Supplement No. 4 reads: "In the matter of wages, hours and other conditions of employment of employees in the mechanical departments (specified herein) of the railroads under federal control it is hereby ordered." The fact that in this introduction, employees in the mechanical department only are mentioned makes it possible to construe Supplement No. 4 as excluding many signalmen and others handling wires and apparatus carrying 240 volts or over as these men have never been considered as employees of the mechanical department; and in the wage adjustments certain roads have not included them. It is evident that one of the interpretations is in error. Either the men on the first group of roads are getting consideration they are not entitled to or those of the other group are being denied their rights. The situation at best is unfortunate, and it is to be hoped that an explanation of the exact intent of the supplement will be forthcoming, without delay.

Seven Months of Government Control

DIRECTOR GENERAL McADOO has made a report to President Wilson, reviewing the work done by the Railroad Administration during the first seven months of its existence. The report, as the director general says, is necessarily fragmentary, since not only is "the reconstructive work undertaken not entirely complete," but full statistical data regarding the things done and results accomplished are not available.

In reading the director general's report the mind naturally reverts to President Wilson's statement that government control was adopted entirely as a war measure, and his assurance that "nothing will be altered or disturbed which it is not necessary to disturb." The report of the director general, referring to the numerous radical changes which have been made, shows that in Mr. McAdoo's opinion, at least, there were many things it was "necessary to disturb."

There were three classes of conditions in the transportation field which, apparently, caused President Wilson to take over the railroads. These were, financial conditions, labor conditions, and operating conditions. It is interesting in reviewing the director general's report, to consider how the problems presented by these conditions have been met.

The financial plight of the railway companies was becoming desperate. Expenses were advancing portentously, while freight and passenger rates were being held almost

stationary by state and federal commissions. It was essential to the maintenance of the solvency of many companies that the government should permit extensive advances in rates or guarantee the net returns of the companies. The government really has done both. Having taken the railroads over, it has adopted a policy of advancing rates which practically insures that the roads will not incur a permanent deficit under government control. This will tend to maintain the value of the companies' securities. The government also has practically guaranteed the net return the railways earned during the last three years before government control, and the director general has adopted a contract form which the Railway Executives' Advisory Committee has advised the railway companies to accept. Therefore, for the period of the war, the government has fairly well solved the financial problem of the railways.

As to the financial problem which will be presented when the properties are returned to the companies, that is another matter. Mr. McAdoo refers to some economies which have been effected by the Railroad Administration. These include \$4,615,000 in official salaries; \$1,500,000 in legal expenses, and approximately \$23,600,000 through the elimination of competition in traffic. With total operating expenses increasing more than a billion dollars a year, such savings are matters of small consequence. It is not unlikely that the savings in official salaries will, in their adverse effect on efficiency, cost more than they are worth. With expenses on so much higher a level, will the government be willing, after the return of the roads to their owners, to leave rates on the high basis on which it has found it necessary to put them? The answer to this question will largely determine to what extent the financial problem of the railways has been solved.

The labor problem with which the railways were confronted at the time of the adoption of government control was of the greatest difficulty and importance. There was a time when the labor employed on railways was the best paid in the country. The enormous advances which had rapidly occurred in the wages paid by the government and private industries engaged in war work had, however, created great dissatisfaction among railway employees and in the absence of corresponding advances in railway wages the roads were in danger of losing a large part of their most valuable employees. The government was in a far better position to deal successfully with this problem than the companies. It could make whatever advances in wages were necessary, and then make whatever advances in rates were necessary to offset them. The advances in wages thus far made are estimated at \$500,000,000 a year, and practically all have been the result of recommendations received by the director general from boards and commissions appointed by him. On the whole, the Railroad Administration has dealt successfully with the labor problem. It does appear that in some cases it has made larger advances in wages than were necessary, and that it is showing a tendency, in cases of conflicts between officers and employees, to make concessions to the latter which bode ill for the future of discipline upon the railways; but probably it would be easier to find fault with the way the labor situation has been handled than to have handled it any better. It need hardly be said that the saving of about \$5,000,000 in the salaries of the officers will not go far in paying the increase of \$500,000,000 in the wages of the employees.

A large part of the director general's report is devoted to a description of the reorganization of the railway operating staff which has been undertaken and of the operating results which have been secured. Government control has been abandoned and government operation has been adopted. Federal managers have been substituted for the presidents of the companies as the chief executives of the individual lines, and district managers, regional directors and direc-

tors of departmental divisions have been appointed, to whom the federal managers report. The railways have been regrouped, and there has been a vast centralization of authority in the regional directors and in the central administration at Washington.

It is contended by spokesmen of the Railroad Administration that the result has been a "striking increase in the efficiency with which the railroads are being operated." There has been a "striking" improvement in transportation conditions since last December. It happened, however, that owing chiefly to government preference and priority orders and weather conditions, the transportation situation at that time was the worst ever known. While the present situation represents a great improvement over that which existed last winter, it represents little or no improvement over that of a year ago, when the railways were being operated under the Railroads' War Board. The business of the country is being handled as smoothly and expeditiously as could be expected in the circumstances, but not quite as much freight business has been handled thus far this year as last year. All things considered, this is not surprising. A year ago the railways were being operated with the greatest efficiency ever known. The period since government control was adopted has been one of transition, and the changes made in the organizations have been so drastic that it would not have been surprising if there had been a marked decrease in efficiency. While the railroads have not handled quite as much freight business as last year, they have handled it in a somewhat more orderly and satisfactory way, and this is a high tribute to the skill with which the operating problems have been solved.

Mr. McAdoo refers to what has been done in the standardization and purchase of equipment, and in the promotion of needed improvements and betterments in terms which indicate that he is satisfied with the progress which has been made. This is one of the weakest parts of his report, and touches upon probably the weakest part of his program as thus far carried out. The thing most needed to enlarge the capacity of the railways is to enlarge their facilities. Considering all the power and resources at its disposal, the Railroad Administration has thus far made a progress in increasing the facilities of the railways that has been lamentably slow and small. Its spokesmen have attempted to make it appear that its attempts to standardize equipment, and the snail-like methods used by its purchasing department, have not delayed increases in the amount of equipment. It is an outstanding fact, however, that, although it is now September, only a trifling number of its standard locomotives have yet been delivered, while as to the standard freight cars, the director general says in his report, "it is expected that the manufacturers can commence delivering them early in September." After eight months of government operation the Administration was still talking of the "commencement" of the first deliveries of cars ordered by it. In other words, actual developments are completely vindicating the criticisms and predictions regarding delays in the obtaining of equipment which the *Railway Age* began making last February, when the Administration's program of standardization was first announced. If the Railroad Administration had promptly ordered already existing types of locomotives and cars last spring, as it should have done, the present and prospective conditions with respect to the supply of equipment would be much better than they are.

Mr. McAdoo has selected his chief lieutenants from among the leading railway men of the country, and, as he shows in his report, he is paying them salaries as high as \$40,000 to \$50,000 a year. He is doing this because "it is not only equitable but necessary that they should be justly remunerated," and also "to make the juniors realize that the promotions and rewards of a railroad career are still worth working for." There are not wanting persons who question his wis-

dom both in employing former executive officers of railway companies in these positions and in paying such large salaries. The Hearst newspapers have published an editorial, entitled "A Conspiracy to Discredit Federal Control of Railways," in which they charge that the "old railroad chiefs" are engaged in sabotage to reduce railroad efficiency. "Mr. McAdoo ought," say these papers, "as fast as he can, to replace these old railroad chiefs with a younger generation of railroad men, who, by winning their spurs in the government service, have everything to gain by their success and nothing to lose." The Chicago American, in which this editorial appeared, bore the same date as the director general's report to the President. In his report Mr. McAdoo said, "Officials and employees have worked with such loyalty and zeal to accomplish what has already been done that it is a genuine pleasure to make acknowledgment of their splendid work. It is a constant satisfaction to be associated with them. You can rely upon their patriotic enthusiasm and alacrity in the work of winning the war, in which they as well as the soldiers at the front have enlisted with such laudable determination and patriotism."

Hearst charges that the important railway men in the service of the Railroad Administration are traitors. McAdoo says that they are serving the government with energy, loyalty and patriotism. To be libeled by Hearst and lauded by McAdoo on the same day should be glory enough for the "old railroad chiefs" for that one day.

The Compensation Contract

ALTHOUGH THE FINAL DRAFT of the standard clauses for the compensation contracts between the government and the railroads, offered to the companies last week by Director General McAdoo, does not represent as complete protection of the interests of the railroad companies as they believed themselves entitled to, the Railway Executives' Advisory Committee has recommended its acceptance on the grounds both of enlightened self-interest and the dictates of patriotism. The form of contract is still unsatisfactory to the representatives of the National Association of Owners of Railroad Securities, but in view of this action of the committee which represents the corporate officers of about 90 per cent of the railway mileage of the country the reiteration of the objections made by Mr. Warfield and Mr. Untermeyer will hardly carry a great deal of weight.

At the same time, it is not out of place to emphasize the fact that the railroad executives have felt obliged to accept the contract as offered by the government, after having secured such modifications as they were able from the first draft proposed by the representatives of the director general, because it was the best they could get under the circumstances and as the only practicable course to adopt. The enlightened self-interest which the committee in its report says requires the acceptance of the contract, refers undoubtedly to the circumstance, which it mentions later, that the companies have already lost the possession and use of their properties for the period of federal control and are at present without any assurance of compensation; that their hope for compensation must be based on the federal statute and the basis for negotiation with the government which it prescribes, in other words what the Railroad Administration sees fit to offer them, or on another appeal to Congress, or on litigation. The first of these possibilities is characterized as in the highest degree unwise and the second as likely to result in ruin, because litigation would involve such uncertainties and delays, and such impairment of security values during the period necessary to carry the cases through the courts, "as to place litigation clearly outside of the range of practical remedies."

The patriotism referred to as another reason requiring the

acceptance of the contract, lies in a full recognition of the facts that the Nation is at war, that all are expected to make sacrifices and to take chances, that the government has for war purposes been invested with unprecedented discretionary powers in respect to every interest, and "that it is in any event, our government, of which we are entitled to expect that there will be no wanton exercise or abuse of power." In other words, if chances have to be taken, the risks must be assumed by private interests rather than by the government as the representative of the public interest.

Many phases of the proposed contract leave much to the fairness and discretion of the director general but there is no reason for doubting that he can be trusted not to abuse his great power.

The principal point of objection made by the railway executives at the time of the meeting to consider the draft of the contract as it stood on July 5 was corrected by the representatives of the administration in the draft of August 7 before the hearing before the director general himself was accorded. The purpose of that change was to include rentals payable for leased or operated lines among the other items, such as interest and sinking funds, in which the companies should be protected before the director general may make deductions from the compensation to pay for additions and betterments.

Director General McAdoo has made some further slight concessions after hearing the representatives of the companies and of the security owners, but their most important contentions he has denied. One of the most important of these points, on which the statements issued by the security owners' association have laid so much stress, involved the so-called acceptance clause, requiring that the companies should accept the contract compensation as full satisfaction for all claims for loss and damage to business or traffic by reason of the possible diversion to other lines. The Railroad Administration secured an opinion from the solicitor general that the compensation which the statute provides for is intended to cover such elements as loss of good will and the division or diversion of traffic and the law committee representing the companies has reached a similar conclusion. The committee says that if the companies are not satisfied with the amount of such compensation as they can get by agreement in full settlement they are at liberty to go into the Court of Claims for an award which would recognize such claims but that the government cannot pay more than is authorized by the federal control act.

This point, as well as the great discretion allowed the director general to order additions and betterments to a company's property at its own expense, the committee finds to be controlled by the statute and therefore they consider it of no avail to make further objection.

The final outcome of this stage of the negotiations demonstrates the foolishness of the fears expressed by some of the conspicuous former critics of the railroads that the companies were going to be treated too liberally by the guarantee of their pre-war net operating income (which has since been translated into "not exceeding a sum equivalent as nearly as may be to that amount") or that the government was going to rehabilitate their properties at public expense and then turn them back to their owners.

The contract offered by the government does virtually guarantee payment of the interest that was regularly paid during the pre-war period and sums sufficient to support the corporate organization, to keep up sinking funds and to pay taxes and rents, but the payment of even the amount of dividends regularly paid during 1915, 1916 and 1917, is made dependent upon the director general. Regular dividends are given some protection by the stipulation that "it will be the policy of the director general to so use his power of deduction from the compensation as not to interrupt unnecessarily the regular payment of dividends as made by the company dur-

ing the test period," and Mr. McAdoo says in his statement that his insistence on the right to use a part of the dividend fund if necessary to pay for deferred maintenance or necessary improvements "need not operate to embarrass any company which has paid dividends on a provident basis" and has retained a substantial surplus of its income.

Dividends of some of the roads that have felt it necessary to make payments to their stockholders in spite of the fact that the system of government regulation under which they were operated would not allow them enough for dividends and a surplus, too, will doubtless be placed on a basis even more precarious than in the past, but the power of deduction is declared to be an emergency power, to be used by the director general only when he finds that no other reasonable means is provided, and if the result works a hardship such a case would represent not only the fortunes of war but a remnant of some of the unsatisfactory conditions which prevailed in the transportation business even in time of peace.

If the contract as proposed is not completely satisfactory in all respects some consolation may perhaps be derived from the fact, to which Mr. McAdoo calls attention in his statement, that the condition of the railroad companies might have been much worse if left to work out their own salvation under such circumstances as confronted them last December. The railroad security owners could hardly have expected to have greatly improved their condition as the result of a war.

While it would be too much to anticipate that a standard form of contract could be drawn to meet all conditions and while some further negotiations will still have to be carried on in making the contracts with the individual companies, the fact that a form of contract governing a matter of such magnitude and intricacy has been offered in a form so nearly satisfactory should be a source of some gratification, and its acceptance by a majority of the roads and the consequent avoidance of protracted and dangerous litigation is greatly to be desired. The railroads have been the center of so much bitter controversy in recent years that the absence of a controversy with the government in this instance will be especially welcome at a time when the controversy with the Hohenzollerns requires all our interest.

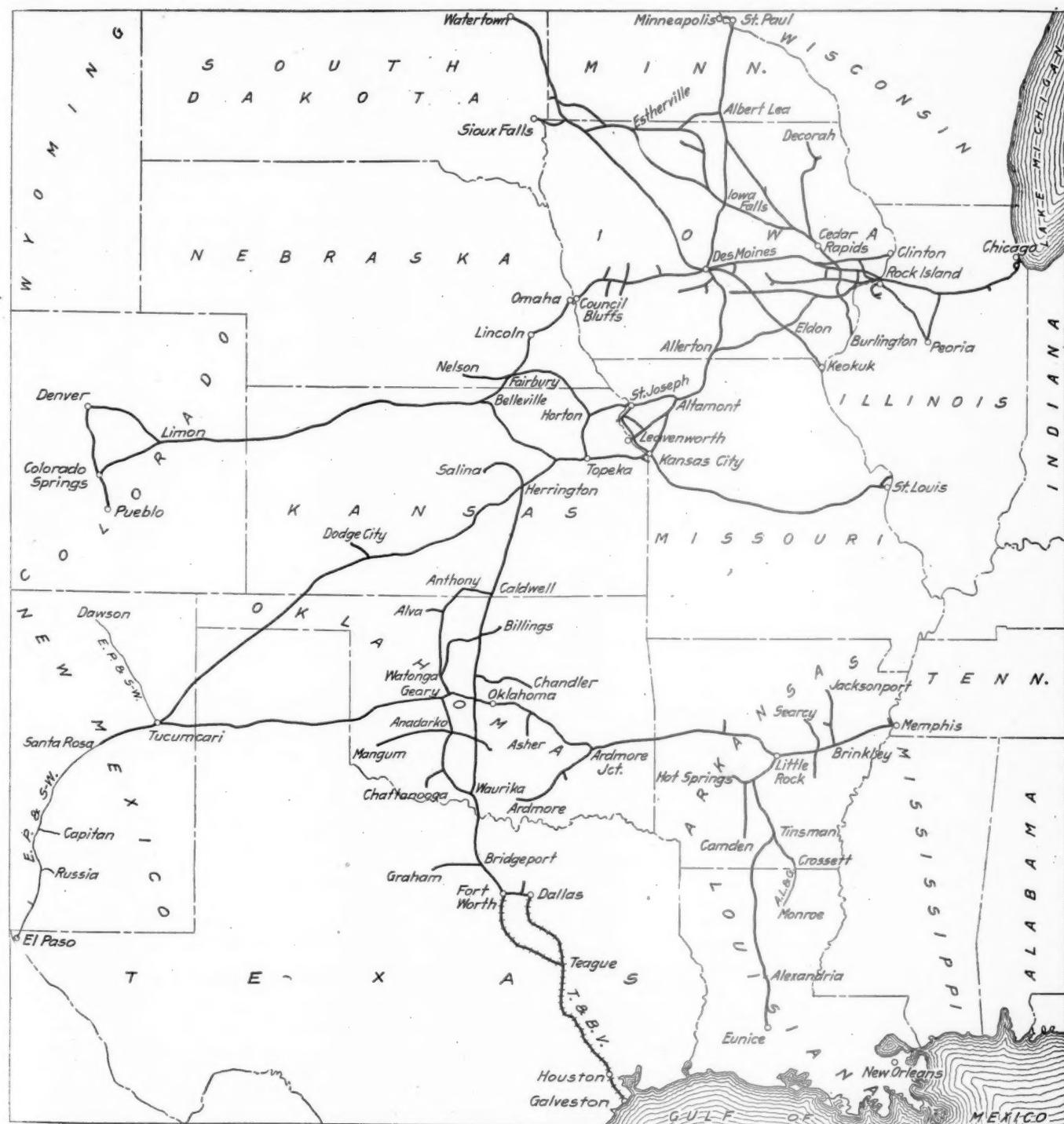
Chicago, Rock Island & Pacific

IN DISCHARGING THE RECEIVER of the Chicago, Rock Island & Pacific in June, 1917, Judge Carpenter of the Federal Court said: "The able administration of this property by Judge Dickinson as receiver, has made this extraordinary proceeding possible. This is a reorganization without a sale, the property returning to the original company, and in this the proceeding is historic among receiverships. I can't say too strongly how much credit is due to Judge Dickinson and the fine co-operation he has met with from the stockholders. The Rock Island will pay its debts and it has plenty of money with which to pay them." The whole Rock Island case since the application which was made for a receiver with the consent of a part of the board of directors and without the knowledge of others on the board, up to the present time, has been unusually interesting. Controlling interests in the old company insisted that a receivership was necessary and made light of the argument of minority stockholders, led by N. L. Amster of Boston, that the company could earn its fixed charges and that all that was necessary was to do a certain amount of temporary financing and that, moreover, bankers could be found, were it not for the attitude of the controlling interests in the company, who would be willing to do this financing. The controlling interests claimed that a foreclosure under the first and refunding mortgage was a necessity.

In 1916 the Rock Island earned \$80,889,000 gross and, after

paying expenses and deducting the amounts due for interest, rental, etc., the company would have had \$8,078,000 surplus. The facts thus offered such a strong refutation of the contention of the controlling interests that they joined with the minority interests in working out a plan for a reorganization without foreclosure. Under this plan the \$20,000,000 gold 5 per cent debentures on which interest had been defaulted

000 was received in settlement of a suit against former directors. The remainder was treasury cash and interest. This cash was used to pay off \$12,875,000 first mortgage bonds with the full interest due, \$5,582,000 receivers' certificates, \$7,500,000 collateral trust notes, \$4,140,000 short term loans, \$1,958,000 interest on the \$20,000,000 debentures (making the full interest payment due up to the time these bonds were



The Chicago, Rock Island & Pacific

were exchanged for \$20,000,000 par value 6 per cent new preferred stock, and common stockholders paid a 40 per cent assessment, receiving therefor new 7 per cent preferred stock.

A total of \$35,832,000 cash was raised, of which \$29,422,000 came from the sale of 7 per cent preferred to the stockholders as described above, \$5,000,000 from the sale at par of 6 per cent preferred stock to former directors and \$500,-

exchanged for preferred stock) and \$3,777,000 for the purchase of \$2,049,000 Consolidated Indiana Coal Company bonds and for the expenses of reorganization. The retirement of the first mortgage bonds left the company with \$40,181,000 first and refunding mortgage bonds free in its treasury and \$1,965,000 first mortgage Rock Island Arkansas & Louisiana bonds and \$2,545,000 St. Paul & Kansas City short line first mortgage bonds free in its treasury. The re-

organization took place in June and the company passed out of the hands of the receiver June 24, 1917, although the receiver was not finally discharged until July 27.

On December 31, the reorganized company had \$4,104,000 cash on hand and \$3,722,000 special deposits with no loans and bills payable. As of that date there was \$128,905,000 stock outstanding of which \$74,483,000 was common and \$54,422,000 preferred. The total long term debt was \$220,378,000. This was a reduction as compared with December 31, 1916, of \$50,633,000 in long term debt besides the taking up of \$4,100,000 loans and bills payable.

In 1917 the Rock Island earnings amounted to \$89,609,000 which was 10.78 per cent more than the 1916 earnings. Expenses, however, amounted to \$66,046,000, an increase of 19.88 per cent over the previous year. Taxes were increased by \$579,000 or 15.37 per cent, so the total available for interest and dividends amounted to \$20,622,000, a decrease of \$2,806,000 or nearly 12 per cent. With the exchange of the \$20,000,000 debentures and paying off of floating debt, there was a reduction in interest charged of \$1,738,000, the total interest charges in 1917 being \$10,648,000. After interest charges and rentals there was \$7,527,000 available for dividends or only about half a million dollars less than in the previous year. The company paid out in dividends \$1,780,000, leaving a surplus to be carried to profit and loss of \$5,747,000.

The handling of the profit and loss account is rather interesting. There was a debit balance to this account of \$5,024,000 on December 31, 1916. This was somewhat more than offset by the balance carried to the account from 1917 income. The company then credited profit and loss with \$7,866,000 "expenditures for additions and betterments made prior to March 31, 1902, and charged to operating expenses instead of to capital account." The profit on the sale of Chicago terminal property amounted to more than half a million dollars and the \$500,000 received from former directors was also, of course, a credit. The book value of timber lands in Minnesota were re-appraised and the value written up \$1,685,000. There were other smaller credits, and there was a debit made of \$1,227,000, the expense of reorganization, and other minor debits, leaving the company with a credit balance at the end of 1917 of \$9,938,000.

The company spent \$3,608,000 for additions and betterments to road and a net amount of \$161,000 for additions and betterments to equipment. Of the largest expenditure there was \$189,000 spent on applying steel draft arms to freight equipment, \$135,000 spent on applying steel underframes, \$52,000 on new appliances exclusive of those required by federal and state laws, \$49,000 for applying girder beams between center sills of box cars and \$37,000 for applying superheaters and brick arches to locomotives. The value of equipment destroyed or dismantled was charged partly to this account and partly to profit and loss.

The increase in expenses was not at all out of line with the experience of roads generally except possibly that the maintenance of equipment expenditures were somewhat higher proportionately to the expenditures in 1916 than on many roads. Maintenance of equipment cost \$16,886,000 in 1917, an increase of 28.23 per cent. Transportation expenses amounted to \$33,885,000, an increase of 22.02 per cent.

The cost of fuel per ton (the Rock Island figures 147 gallons of oil equal to one ton of coal) was \$2.3472 in 1917 as compared with \$1.9541 in 1916. It cost the Rock Island a little over 10½ cents per ton for fuel station operation in 1917 as compared with a fraction over 9 cents in 1916. Locomotives ran on an average of 11.84 miles to a ton of coal in 1917 as compared with 12.27 miles in 1916.

The total number of tons of all freight carried was 33,448,000, an increase over 1916 of 4.97 per cent. The average haul of all freight was 240 miles, an increase of 6.68

miles, so that the total ton miles handled was 8,014,000,000, an increase of 7.98 per cent over the previous year. The average train load was 442 tons, an increase of 14.68 tons. A good showing was made in heavier car loading, the average load per loaded car being 21.55 tons in 1917 as against 20.34 tons in the previous year.

It will be particularly interesting to watch the effect on earnings of operation under government control of the Rock Island. The Rock Island between many of the most important cities reached by it competes with other and what under private control would have been called stronger (financially) lines, but, on the other hand, the Rock Island was at a good many places handicapped as compared with its competitors in the way of terminals. If the Rock Island lines between Colorado and Chicago are not by any means as good as the Santa Fe's lines, as is generally conceded, traffic may be transferred from the Rock Island to the Santa Fe if the Santa Fe's capacity is ample to take care of this traffic, while, on the other hand, it may be found advantageous to give traffic to the Rock Island at some terminal points where heretofore lack of the company's own terminal facilities has shut it off from this business.

In the six months ended June 30 last, the Rock Island earned gross \$43,830,983, and had operating income, available for interest and dividends of \$3,217,174, a decrease of \$4,476,248.

The following table shows the principal figures for operation in the calendar year 1917 as compared with 1916:

	1917	1916
Average mileage operated.....	8,218	8,088
Freight revenue	\$59,690,072	\$55,141,668
Passenger revenue	23,301,086	19,674,370
Total operating revenues.....	89,608,722	80,889,129
Maintenance of way and structures.....	10,863,551	10,097,734
Maintenance of equipment.....	16,885,582	13,168,137
Traffic expenses	1,795,112	1,716,087
Transportation expenses	33,884,630	27,769,887
General expenses	2,336,506	1,968,289
Total operating expenses.....	66,046,104	55,091,717
Taxes	4,345,202	3,766,294
Operating income	19,193,048	21,992,343
Gross income	20,622,243	23,428,685
Net income	7,527,145	8,078,189
Dividends	1,779,774	.....
Surplus	5,747,372	8,078,189

New Books

Ports and Terminal Facilities. By Roy S. MacElwee, Ph. D. 315 pages, illustrated, 6 in. by 9 in. Bound in cloth. Published by McGraw-Hill Book Company, New York City. Price \$3.

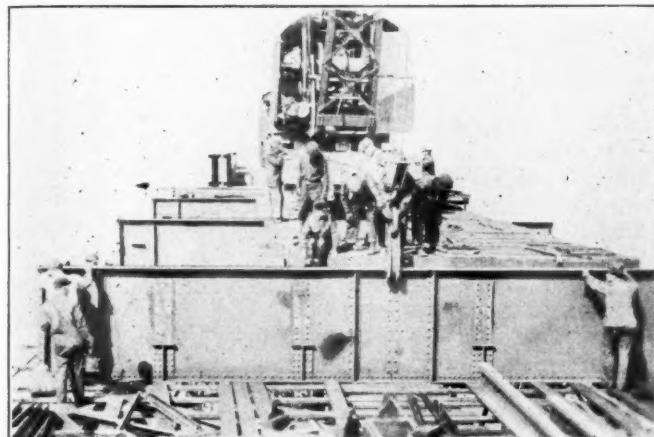
This is a very thorough and vigorous discussion of the subject indicated by the title, and the author shows that he is master of his job. He is lecturer in economics and foreign trade at Columbia University and the book is based on material gathered for lectures at the university; but he is much more than a lecturer. He has studied his subject carefully in Europe, as well as in America, and for six years was in charge of the Hamburg office of an American firm that built hoisting machinery. The book is full of information brought right up to date, and the illustrations are modern and instructive—though some of the half-tones are rather poor. The text also has errors here and there. Indicating the scope of the work, the titles of some of the 18 chapters are: Relative Importance of the World's Leading Ports; Port Competition; Harbor Belt Railways; Cartage, Drays and Motor Trucks; Shed Equipment; Standard Package Freight; Inland Waterways and the Seaports; The Free Ports of Hamburg and Bremen. The author was called into the national service and his work was cut short; and he intimates that possibly a second volume may be written, dealing with the financial aspect of port industry, the combination of beauty with utility in the waterfront, port administration, and other points which could not be dealt with in the present volume because of lack of time.

Strengthening Poughkeepsie Bridge Superstructure

Gauntlet Track Operation Will Permit Heavier Loading on This Noted Hudson River Crossing

AFTER NEARLY 30 YEARS of service, during which it was once extensively reinforced, the Poughkeepsie bridge over the Hudson river has again been subjected to extensive modifications which are expected to afford a material extension to its useful life. The principal alteration recently undertaken to increase the capacity of the structure for heavy train loading is a change from double-track to single-track (gauntlet) operation over the main river structure; the main physical changes comprising a renewal of the floor

Company, which awarded a contract to the American Bridge Company for the construction work. The latter started work on the sub-structure, and after completing a portion of two of the piers, experienced financial difficulties and was compelled to suspend operations in 1878. No further work was done until 1886 when a reorganization was effected and a new contract was let to the Union Bridge Company of New York, which started work the same year. The bridge was completed in December, 1888, when it was taken over for operation by the Central New England & Western Railroad, which formed a link in a through line from Campbell Hall, N. Y., to Hartford, Conn. In 1892 a reorganization took place, under which the Poughkeepsie Bridge Company and the Central New England & Western Railroad were consolidated



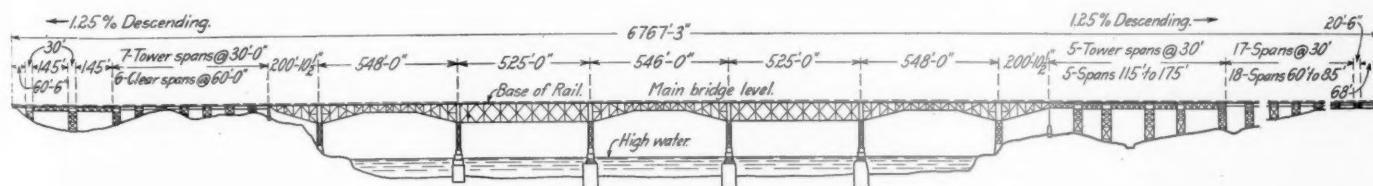
One of the New Floor Beams for the Main Bridge

system to permit the track to be placed in the new position. Aside from this, considerable reinforcing was added to the viaduct approaches at each end of the main structure.

Much interest attaches to the present work because of popular interest in the structure itself, one of the earliest cantilever bridges built in this country. It is the only bridge which crosses the Hudson river south of Albany and for nearly 30 years it afforded the only direct rail connection between New England and the south Atlantic states. This distinction was not relinquished until last year when a more southerly rail connection was afforded by the completion of the Hell Gate bridge, with its connection through the Pennsylvania tunnel under New York City. The structure is the

to form the Philadelphia, Reading & New England—a corporation controlled by the Philadelphia & Reading. When the latter road entered a receivership in 1893, the Philadelphia, Reading & New England was placed under a separate receivership, which remained in effect until 1899 when a reorganization took place that led to the formation of the Central New England, under the control of the New Haven.

The main structure is 3,093 ft. 9 in. long and, as indicated in the general drawing, consists of three cantilever spans of 546 ft. and 548 ft., supported by two fixed spans of 525 ft. and two anchor arms of 200 ft. 11½ in. The east approach, which is 2,640 ft. long, consists of a viaduct composed of plate girder spans 60 ft. to 85 ft. long, between 30-ft. tower spans, except near the main structure where there are several deck truss spans varying from 115 ft. to 175 ft. in length. The west approach is 1,033 ft. long, and consists of a viaduct having 30-ft. tower spans and 60-ft. clear spans for a length of 630 ft. with two 145-ft. pin-connected



Elevation of the Poughkeepsie Bridge

property of the Central New England, a corporation controlled by the New York, New Haven & Hartford, through ownership of practically all of the stock. It provides the main coal route into the New England states. Connections at Campbell Hall and Maybrook, with the Erie, the Lehigh & New England and the Lehigh & Hudson, afford access to roads reaching both the anthracite and bituminous fields.

The history of this structure commenced in 1871 when a charter for a bridge across the river was granted by the legislature of New York state to the Poughkeepsie Bridge

deck truss spans, also carried on towers 30 ft. long. The structure is high, the track being 212 ft. above high water level. The piers extend 30 ft. above and 135 ft. below the surface of the water, having been sunk entirely by open dredging in timber cribs. In the main structure the superstructure originally consisted of two trusses 30 ft. center to center, with the track supported on a floor system resting on the top chord. In the viaduct the superstructure consists in general of three trusses or girders, with the track supported on ties placed on the top chords of trusses and girders.

The original structure was designed for a train loading on each track of 3,000 lb. per lin. ft., preceded by two locomotives having four 24,000-lb. axle loads. In 1906 the bridge was reinforced to carry on each track a train consisting of 3,600 lb. per lin. ft., preceded by two locomotives each having four axles with 45,000-lb. loads each, 5 ft. center to center, or a total weight of 200,000 lb. on a wheel base of 22½ ft. followed by four tender axles of 28,000 lb. each. The earlier reinforcing consisted essentially of introducing center trusses, strengthening the side trusses and adding new floor beams on the main spans, and in replacing nearly all of the girders and trusses in the approach spans, as well as reinforcing the towers by adding center columns to most of the bents. The towers of the main spans, which consisted of double A-frames with two batter posts supporting each truss, were amplified by the addition of similar A-frames to carry the new center trusses. In all about 15,000 tons of new structural steel was used.

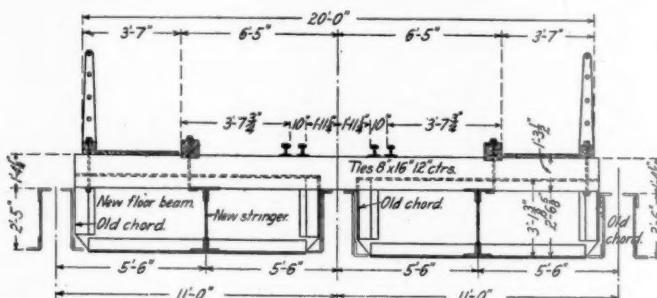
Structure Again Required Strengthening

Owing to the desirability of using the bridge for locomotives heavier than those provided for in the strengthening work done 12 years ago, it became necessary to reinforce the structure once more; this time to allow for the use of locomotives equivalent in weight to two Santa Fe-type engines having weights distributed as shown in the diagram, followed by a load of 6,000 lb. per lin. ft. of track. As this is a load very much in excess of that originally provided for, the idea of strengthening the trusses of the main spans and the long spans of the east approach to carry this load on two tracks proved impracticable, while the cost of renewing these spans under the present high cost of structural steel was deemed inadvisable. In consequence, it was concluded to sacrifice the use of one track over this distance of 4,000 ft. and substitute a gauntlet track, so that the trusses would be called on to carry only one train at a time.

This implied provision for a new floor system on these spans, which could distribute the greater load from a single track over all three trusses, with floor beams designed so that they could later serve for double track in the event of the subsequent construction of new trusses. It was concluded

the old one, except that the floor beams are continuous over the three trusses and are very heavy, being designed for the condition of carrying double track loading when supported at the ends only in a future two-truss bridge. The object of the continuous floor beam is to distribute the loading from the gauntlet track to the three trusses. Only two lines of stringers were provided for the support of the gauntlet track, one on either side of the center line of the bridge, although the floor beam webs have stringer connections provided for four stringers in their future re-use.

In placing the new floor, one track was eliminated and the other was shifted to the center line of the bridge, resting on



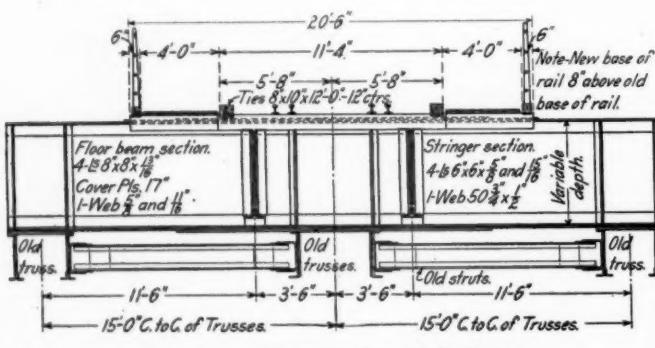
New Floor Construction on the Deck Truss Spans of the East Approach

the two old center stringers. This was done for one-third of the length of the main spans at one time. Then the old outside stringers were cut out. The track was then broken, the rails and ties of one panel taken up and the two stringers that were carrying the traffic were removed. The old floor beams were then cut out and the new stringers and floor beams set in place, using the same connection holes in the chords. This work was repeated panel by panel, two and sometimes three panels being replaced in a day. As the new track level is above the old, owing to the greater thickness of the floor, it was necessary to make an eight-inch run-off when restoring the track. Three inches of this raise was obtained in the temporary track ties, leaving five inches to be made with blocks.

East Approach Truss Spans

About 800 ft. of the east approach adjacent to the river consists of truss spans ranging from 115 ft. to 175 ft. in length, spanning between viaduct towers with deck plate girder spans across the 30 ft. length of each tower. There are three trusses or girders in each span, the double track having been supported by 8-in. by 16-in. ties 25 ft. 6 in. long resting on the top chords and spaced 16 in. center to center. The change to single track involved provision for two lines of stringers 11 ft. center to center, symmetrical with the center line of the bridge, to be carried on floor beams supported by the top chords of the trusses. As the tops of the stringers had to be approximately at the same level as the tops of the chords, it was necessary to frame the floor beams into the chords on each side of the center truss. Similarly floor beams had to be provided between the girders of the tower spans. This entailed considerably more alteration of the existing structure than was the case in the main river spans. Filler plates had to be placed over the webs of the chords and diaphragms were required between the webs at the points of the floor beam connections. Owing to interference with the pin-connections, the floor beams were offset about 1 ft. 6 in. at each alternate panel point. Consequently every second length of stringer was about 3 ft. longer than the alternate ones.

The space occupied by the new floor system had formerly contained the old lateral system, consisting of four angle struts fastened to the main pins by U-plates with rod diagonals. As these had to be removed they were replaced



New Floor System for Main Spans

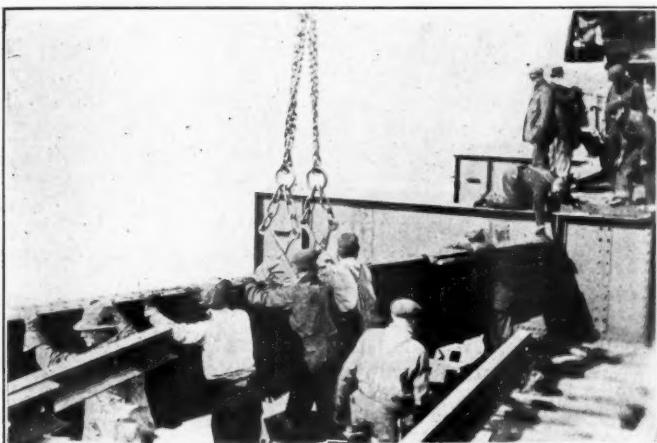
to retain double track on the approaches, except over the truss spans of the east approach. This involved strengthening the outside columns of 11 towers in the east approach, strengthening the center columns of three towers in the west approach and provide new bracing for seven towers in the east approach and five towers in the west approach, as well as strengthening practically all main members in the center trusses of the two 145-ft. spans in the west approach.

New Floor on the River Spans

The old floor on the main span consisted of floor beams at each panel point, resting on the top chords of the three trusses with four lines of stringers, two for each track, framed into them. The new floor is of the same general construction as

by new laterals, following modern practice with plate connections to the chords.

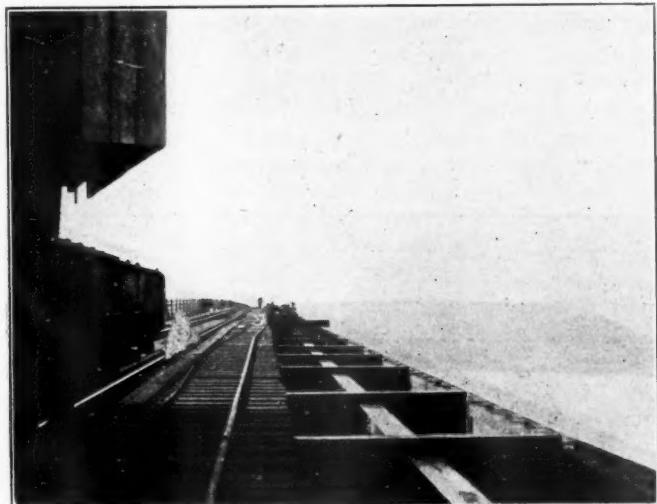
The first work was to take up the old westbound track for the full length of this change, remove the ties and cut out the old struts and laterals. These were cut out with oxy-acetylene torches and by rivet cutters. Holes were then drilled in the old chords to receive the new floor beams and filler plates. This was followed by the erecting of new floor



Placing a New Stringer on the Main Bridge

beams and stringers between the center and north chords. The track was then restored on the north side, supporting the ties on the old chords with blocks so as to clear the new stringers. With the traffic back on the old westbound track the operation was repeated on the south side. With the new steel all in, the permanent ties were slipped in between the temporary ties, the gauntlet track installed and the tracks then taken up from the old westbound location.

For this work the new steel was taken out on the bridge on flat cars. The first work was to set in two floor beams



New Floor in Place on East Approach Truss Spans

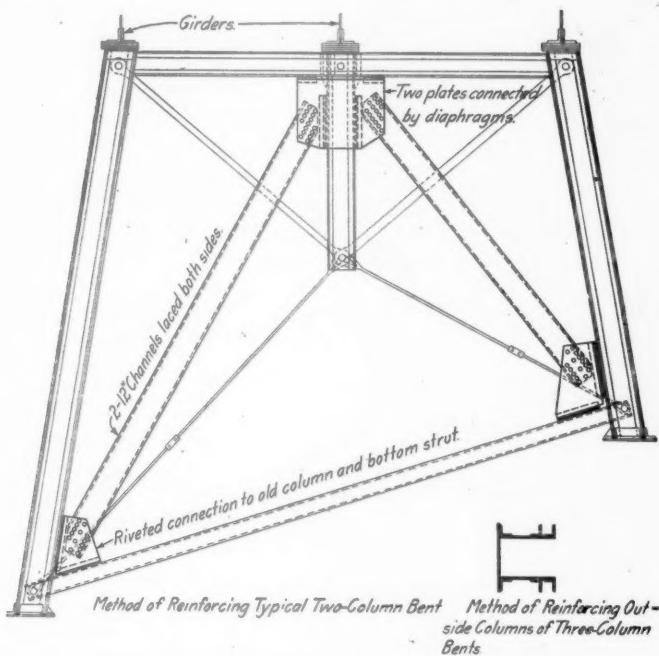
with a locomotive crane, then the stringers, then another floor beam, then the stringers, etc. On an average, 10 panels of steel were placed in this way per day.

Reinforcing the Viaduct Bents

The bents of the viaduct are of two types, high bents with three columns and low ones having two columns, the center girder being supported by a simple Fink truss spanning transversely between the tops of the two columns. The diagonals of this truss also form a part of the sway bracing

of the tower. This arrangement was inadequate for the heavier loading and imposed excessive loads on the two side columns; so after considering several plans, it was decided to provide a new support for the center girder by introducing an A-frame consisting of two diagonal struts extending from the top of the bent under the center girder to the bottom of the two columns, forming riveted connections at the intersections of the columns with the bottom tie. These struts consisted of two 15-in. channels laced together, but as the new members pass around the existing bracing of the bent, it was necessary to ship them to the field unassembled, that is, the lacing and battens for one side were shop-riveted to one channel and those for the other side to the other channel.

In the three-column bents, it was necessary to strengthen the batter columns. These are box section members consisting of built-up channels having a cover plate on the outer side and bar lacing on the inner side. As these columns were inadequate, largely because of eccentricity, rather than add flats to the free legs of the inside angles, thereby involving the temporary removal of the lacing bars, new angles were riveted to the webs just back of the old angles as shown



Method of Reinforcing the Approach Towers

in the cross section. As these angles could not be carried past the panel points in the towers, it was necessary to use $\frac{1}{2}$ in. by 4 in. bars on the inside faces of the columns for a length of 5 ft. at such points.

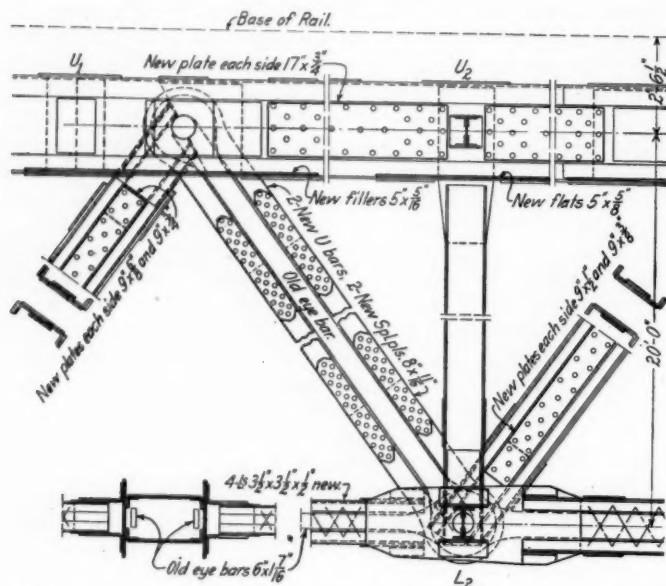
The center columns of the bents supporting the two 145-ft. spans in the west approach also required strengthening. These were of symmetrical section, consisting of two built-up channels laced on both sides. These were reinforced by side plates riveted against the webs between the edges of the flange angles.

Reinforcement of the 145-Foot Spans

One of the most interesting features of the reconstruction was the almost complete reinforcement of the center trusses of the 145-ft. spans. These trusses, which were built new during the reconstruction in 1907, are pin-connected Warren trusses having eye-bar bottom chords with eye-bar diagonals in the second panel from each end, all other members being stiff. The reinforcement of the center truss involved every member except the end panels of the top chords, the center panel diagonals and the intermediate vertical posts. The top chords and the stiff diagonals were reinforced by side

plates against the webs, except that opposite the panel points in the top chord, flats were riveted to the outstanding legs of the bottom angles.

The second panel diagonal, which is a tension member, consisted of two $1\frac{1}{8}$ in. by 8 in. eye-bars. This was reinforced by passing a flat U-bar over each pin and connecting them by two 8-in. by $1\frac{5}{16}$ -in. flat bars. The bottom chord is reinforced from end to end by a new stiff box section enclosing the old eye-bars. This consists of eight angles laced



Part Elevation of Center Truss of 145-ft. Spans of West Approach Showing Typical Reinforcement

on the two vertical sides with battens top and bottom, the battens being shop riveted to one side and were field riveted to the other side after the section had been placed over the eye-bars. These members were carried past the panel points in the bottom chord by splice plates, bored to fit over the pins and provided with connection angles for re-attaching the struts of the bottom lateral system.

The reinforcing members for the diagonal U-1, L-2 were

shipped unassembled. The upper U-members had the holes for connections with the connecting bars drilled in the shop while the lower U-members were left blank. These parts could not be connected up in the shop owing to the limited space available for slipping the U-bars over the pins. After the upper U-bars were in place, the connecting bars were riveted to them at the top end; then the lower U-bars were slipped around the lower pin ready for connection to the lower ends of the connecting bars, the holes in the U-bars being drilled in the field, using the splice bars as templates. However, as it was desirable to secure an initial tension in the reinforcing members in making connections, the two pins were drawn toward each other by means of a cable and steam boat ratchet rig before the holes in the lower U-bars were marked. The drilling was then done $3\frac{1}{2}$ in. below the marks so made, bringing up the connection by means of drift pins. This same method was used in making the connections for the new bottom chords.

The entire work of reinforcing this bridge was carried on under the general direction of Edward Gagel, chief engineer of the New York, New Haven & Hartford. The investigation of the existing structure and the determination of the mode of reinforcement together with supervision of all changes was under the direction of Ralph Modjeski, consulting engineer, Chicago. The Strobel Steel Construction Company of Chicago, had the general contract for all of the reconstruction. The contract was let in January, 1917, and the first of the heavy new engines was allowed over the bridge on May 16, 1918. The work was entirely completed on August 3, 1918.

COAL TROUBLES OF A SPANISH RAILWAY.—The Great Southern of Spain, which carries in normal times upwards of 500,000 tons annually of iron ore, has had this traffic stopped since November last, owing to the company's inability to provide itself with coal at ruling prices. Arrangements have now been arrived at with the mining companies by which the latter pay an increased rate for the transport of their ore, thus enabling the railway to obtain fuel. A cargo of coal reached Spain on July 20 and the iron ore traffic was resumed on the 27th. The freight paid on the coal was \$105, this enormously exaggerated figure comparing with \$1.50 or \$1.75 before the war.—*Railway Gazette, London.*



United States Standard Locomotives Receiving Finishing Touches at the Baldwin Plant

Director General McAdoo Reports to President

Work of the United States Railroad Administration for the First Seven Months of Its Existence

WASHINGTON, D. C.

A REPORT BY DIRECTOR GENERAL MCADOO to the President, under date of September 3, giving an account of the work of the Railroad Administration for the first seven months of its existence, was made public on Monday. Although the period is declared to be "a comparatively short one in which to have made such progress in working out the problems connected with the transfer and co-ordination of the railway systems and waterways of the nation" and Mr. McAdoo says the report is "necessarily fragmentary as the reconstructive work undertaken is not entirely complete and the new machinery that has been installed requires further co-ordination," he finds that "a daily increase in facility and efficiency is nevertheless noticeable" and is "confident that the railroads will shortly be in a condition to meet any demands that may be made of them if needed motive power already ordered can be secured and if the necessary skilled labor is not withdrawn from the railroads for military and other purposes." These, he says, "are very serious phases of the railroad problem."

One of the most interesting features of the report, containing information heretofore unpublished, shows that a saving of \$4,614,889 per annum has been effected in the salaries of officers receiving over \$5,000 a year. The number of such officers on individual roads has been reduced by 400, making a saving of over \$6,000,000, but this is offset by the 136 officers in the regional and central administrations whose salaries aggregate \$1,642,300, so that the net reduction in officers is 264. The expenses of the law departments have also been reduced about \$1,500,000 annually. Among other economies and improvements which may be demonstrated statistically are mentioned an estimated saving of \$23,566,633 effected by the closing of unnecessary freight and passenger offices and curtailment of advertising, the elimination of the accumulation of 180,000 loaded cars above normal on the eastern lines, and an increase of 437,976 cars of coal loaded in the first six months of the year. As a measure of the amount of freight carried, however, the report uses the figures for the month of April showing an increase of 8.9 per cent in ton miles of revenue freight hauled, although the reports for May and June, which both showed decreases, were available at the date of the report. No compilation is given of the amount of the increases in wages or in other expenses.

After giving a description of the organization of the Railroad Administration the report continues in part as follows:

Operative and Corporate Organizations Differentiated

Inasmuch as "no man can serve two masters" and the efficient operation of the railroads for the winning of the war and the service of the public is the purpose of federal control, it was manifestly wise to release the presidents and other officers of the railroad companies with whose corporate interests they are properly concerned, from all responsibility for the operation of their properties, which will be in the hands of the regional directors, the district directors, and the federal and general managers who will be directly responsible to the director general. All ambiguity of obligation is thus avoided. The officers of the corporations are left free to protect the interests of their owners, stockholders, and creditors, and the regional and operating managers have a direct and undivided responsibility and allegiance to the United States Railroad Administration.

In pursuance of this policy the regional directors, the fed-

eral managers, and the general managers have been required to sever any relations they may have had with the railroad corporations as either officers or directors, and the corporate officers have been advised that they have no function to perform with respect to government operation. Many of the former corporate officers have been appointed as officials of the United States Railroad Administration, whereas others have elected to remain as officers of their corporations. It has been made clear that the fullest possible co-operation is desired between the government officers who operate the railroads and the corporate officers who represent the stockholders.

Economies Effected by Reorganization of Official Staff

The reorganization of the operating force has been made without any impairment of efficiency and with a reduction in the number of officers required and in the aggregate of the salaries paid them and chargeable to operating expenses. An accurate computation of the saving in men and money thus effected follows. It includes all officers receiving salaries of \$5,000 a year or over.

	COMPARATIVE SUMMARY OF OFFICERS AND SALARIES UNDER CORPORATE AND FEDERAL CONTROL			
	Number of officers		Salaries	
	Under corporate control	Under federal control	Under corporate control	Under federal control
Regional administration	46	.....	.....	\$821,900
Central administration	90	.....	.....	820,400
Total	136	.....	.....	1,642,300
INDIVIDUAL ROADS				
Eastern Region	703	585	\$6,596,835	4,725,983
Allegheny Region	332	262	2,994,118	2,031,710
Pocahontas Region	239	217	1,384,161	1,131,730
Southern Region	284	214	2,574,352	1,679,290
Northwestern Region	324	267	3,293,025	2,217,059
Central Western Region	385	322	3,910,996	2,710,526
Southwestern Region	68	68	566,700	566,700
Total	2,325	1,925	21,320,187	15,062,998
Grand total	2,325	2,061	21,320,187	16,705,298

This shows that under private control of the railroads 2,325 officers drawing salaries of \$5,000 a year or over were employed, with aggregate salaries of \$21,320,187. Under government control 1,925 officials (a reduction of 400) are doing the same work, and the aggregate of their salaries is \$16,705,298—a saving of \$4,614,889 per annum. This total includes the officers of the various regional districts as well as those of the central administration in Washington, except the director general himself, who receives no salary.

The Salaries Paid

Under private control, salaries as high as \$100,000 per annum were paid officers of railroad corporations. Under government control the highest salaries paid are to the regional directors (of whom there are but seven), and these salaries range from \$40,000 to \$50,000 per annum. This reduced compensation has been fixed for regional directors notwithstanding the increased responsibilities and duties of these directors as compared with those of the presidents of the larger railroad corporations.

The reduction of \$4,614,889 per annum in the aggregate of the salaries paid to the more responsible officials has not been effected by forcing the experienced men appointed by the United States Railroad Administration to accept salaries incommensurate with their responsibilities, although in numerous instances these salaries are substantially less than those they had been earning as officers of the railroads or could

earn in private employment. It is not only equitable but necessary that they should be justly remunerated, and that the rewards of brains, industry, and loyalty should be sufficient to continually attract able men to the service of the railroads as their life's work. It is not a question merely of operating the railroads during the period of the war—this requires, it is true, the best talent that can be secured if the present extraordinary demands are to be met—but it is a question of the post-bellum period as well, when railroad work must continue to be sufficiently attractive to draw constantly to it men of the right quality and caliber. Unless the ranks are uninterruptedly recruited with such men, it will be impossible to maintain the efficient organizations which are essential to the successful management and operation of the railroads of the country.

The salaries paid under government control to the higher officers should be sufficient to make the juniors realize that the promotions and rewards of a railroad career are still worth working for, and that they will be commensurate with those of private enterprise and industry.

The expenses of the law departments have been reduced about \$1,500,000 annually. This has been accomplished by the elimination of a number of men, the reduction of salaries of many others, and the transfer of the general counsel of various roads from the operating pay roll to the pay rolls of the corporation. It is believed that efficiency has in no respect been lessened.

Condition of Railroads When Taken Over

To plan the federal organization and select its personnel has, of course, required time. When the government took control on the 1st of January, 1918, the railroads were in a deplorable condition. Added to an unusually severe winter, the motive power was seriously crippled, and on the eastern lines traffic was badly blockaded by the congestion of unloaded cars at the terminals and elsewhere. The approximate number of loaded cars above normal, on the eastern lines, was 180,000 when the director general took charge of the railroads. To relieve this situation was the first concern, and the energies of the federal organization were exclusively and successfully directed to this end. At the date of this report there are no accumulations of loaded cars on the eastern lines above the normal. That the legislation making the necessary appropriation of \$500,000,000 for a revolving fund did not become law until March 31, 1918, was another cause of delay. Prior to its enactment all plans were necessarily tentative. Much, however, has been accomplished since that date toward co-ordinating the transportation facilities of the country for the winning of the war and the service of the public.

What Has Been Done Thus Far

A list of what has been done, the report says, would be long. Among some of the more important items that it would include are mentioned the contract with the corporations, since announced, the delays in the negotiation of which are declared to have been the fault neither of the railroad corporations nor of the government but inherent in a matter of such intricacy and magnitude. After a brief description of the advances in wages Mr. McAdoo says: "These great and beneficial concessions in the matter of wages and hours of service will, I am sure, be appreciated by the employees and will be requited by their loyal and uninterrupted service to the government and by a determined effort to increase efficiency all along the line." Reference is also made to the orders that women shall be paid the same wages as men engaged in similar work, and that there shall be no discrimination against negro employees.

Regarding the advance in freight and passenger rates the report says:

"It is assumed that these advances in freight and pas-

senger rates will increase the net operating revenue of the railroads by an amount that is about equal to the greater cost of operation due to increased wages and increased cost of fuel and all railroad supplies, but this assumption is more or less conjectural, as it is impossible to say whether the higher rates charged will have the effect of reducing the traffic. Thus far such an effect has not been noticeable, at least in the case of the passenger traffic, which shows a substantial increase on the lines traversing the industrial districts of the country and serving the military camps. This is due to the higher wages paid to workers who have been constantly changing their places of employment as well as to the traveling of our soldiers, who have been granted a special rate of one cent per mile when on furlough, and the journeys made by friends and relatives on visits to the soldiers at the various cantonments throughout the country."

Reference is also made to the uniform freight classification, under which it is declared, "when it becomes effective, it will be practicable to compel a closer compliance with car-loading standards, so preventing the underloading which in the past made the intensive employment of rolling stock difficult. Under competitive conditions this was impossible, because in an effort to hold or get business each competing railroad was disposed to favor the shipper by permitting him to underload cars when it was to his interest to do so."

The Abandonment of Competition

Regarding the saving in traffic expenses the report says:

Inasmuch as there is no longer any competition for freight or passenger traffic between the various divisions of the government railroad system, I have ordered that solicitation of traffic and special exploitation of passenger routes shall be discontinued. In pursuance of this policy the soliciting forces of the various railroads have been either relieved from duty or assigned to employment in connection with the operating departments, and the separate ticket offices formerly maintained in most of the larger cities have been consolidated. In the metropolitan cities, such as New York, Chicago, etc., several consolidated offices in widely separated but equally important districts may be established for the greater convenience of the public. The saving that will be effected as a result of this policy is estimated at \$23,566,633, as per the following statement prepared by the Division of Traffic:

ESTIMATED SAVING EFFECTED BY THE CLOSING OF UNNECESSARY FREIGHT AND PASSENGER OFFICES AND CURTAILMENT OF ADVERTISING

Closing "off-line" offices:	
Eastern region—	
Freight	\$3,209,170
Passenger	496,276
	\$3,705,446
Southern region: Freight and passenger.....	1,937,000
Western region—	
Freight	\$2,000,000
Passenger	500,000
Joint	4,000,000
	6,500,000
Total	\$12,142,446

Consolidation of "on-line" city ticket offices and saving in rent from removal of "on-line" offices:

Commercial freight offices to railroad property—	
Easterly region—	
Freight (estimated)	\$300,000
Passenger	709,187
	1,009,187
Southern region—	
Freight	\$10,000
Passenger	155,000
	165,000
Western region, freight and passenger.....	3,250,000
Total	\$4,424,187

Advertising—General and special, present expense, \$9,500,000 saving... \$7,000,000

Grand total \$23,566,633

Under this head reference is also made to the abridgement of time-tables, the plans for utilizing the services of women as ticket sellers and the elimination of unnecessary and duplicate passenger service. In the territory west of Chicago and the Mississippi river passenger trains traversing

an aggregate of 21,000,000 miles a year have been done away with. In the Eastern district unessential passenger trains that used to travel 26,420,000 miles per annum have also been eliminated and in other regional districts superfluous trains have been annulled. Through travel is being directed to the natural routes. The hauling of special trains or needless private cars has been discouraged, and the schedules are being revised so that connections will be closer. Other reforms being worked out in the passenger service referred to include the common use of the same terminals by railroads formerly in competition and using separate terminals. The same principle is also being applied as rapidly as possible in the consolidation of freight terminals. The necessary readjustments, it is stated, may have caused some temporary dislocation, but the ultimate results will be increased efficiency and capacity.

Shortening Freight Routes

Concerning the shortening of freight routes the report says: Recognizing the fact that a straight line is the shortest distance between two points, extensive studies have been made with the purpose of developing well-graded routes for the transportation of freight that will be shorter than those previously in use. Great progress has been made in this direction, especially in the West, and many new through lines are being developed. One of them from Los Angeles to Dallas and Fort Worth is over 500 miles shorter than the routing via the Southern Pacific lines formerly much used. Another from the oil fields at Casper, Wyo., to Montana and Washington State points is 880 miles shorter than the route formerly used. Fruit from southern California to Ogden is hauled 201 miles less than by the route previously used. Still another route between Chicago and Sioux City is 110 miles shorter than the one previously used. A new route between Kansas City and Galveston has been developed which is 289 miles shorter than the 1,121 miles previously traversed. Eighty-eight miles have been saved by devising a new route between Mason City and Marshalltown, Iowa, and 103 miles by a new route between Fort Dodge, Iowa, and Chicago. The route from southern California to Kansas City has been shortened by 234 miles.

As one example of the economy that has thus been made possible it may be mentioned that recently during a period of about 60 days some 8,999 cars were rerouted in a certain western territory so as to effect a saving in the mileage traveled by each car of 195 miles, equal to a total of 1,754,805 car miles.

Abstracts of other paragraphs of the report follow:

Store Door Delivery and Intensified Use of Freight Cars

On the 1st of January, 1917, the railways of the United States owned about 2,400,000 freight cars. Delay in loading and unloading these cars and their use by both shippers and consignees as warehouses has very seriously diminished the carrying capacity of the roads. If each car makes one trip a month only and is loaded and unloaded so as to save one day a month of the time that it was formerly idle, the result would be equivalent to an addition of 80,000 cars to the aggregate equipment.

Probably there is an unnecessary delay of more than one day a month in loading and unloading cars. To diminish this delay the free time hitherto allowed for loading and unloading has been shortened and a cumulative increase in the demurrage charge hitherto made for unnecessary use has been ordered. As prompt unloading of cars upon their arrival at public terminals presupposes that congestion at the terminals shall be avoided, what is known as the "store door" system of freight delivery has been introduced in Philadelphia and New York and will probably be extended to

other large cities. If the plan shall vindicate the claims of its authors the congestion of inbound freight, which has hitherto prevented the prompt unloading of cars, will be a thing of the past, and it is suggested that ultimately it may be possible to collect outgoing freight by the same trucks which deliver to stores and factories incoming freight hauled from the terminals.

Standardization of Freight Cars and Locomotives

It has long been admitted that the standardization of the engines and freight cars in use on the American railroads was highly desirable, but not until governmental control became a fact has it been possible to secure an effective agreement as to which types of cars and engines should be adopted. It is said that 2,023 different styles of freight cars and almost as many different descriptions of locomotives were included in the equipment of American railroads prior to the war. The facts are not known, but nearly every important railroad had its own specifications for cars and engines. None of these was identical, and they were generally changed in some detail when new orders were placed. There were box cars of both steel and wood, gondola cars, flat cars, hopper cars, refrigerator cars, tank cars, automobile cars, furniture cars, cattle cars, and many other sorts of cars suited to the different varieties of traffic. The lack of standardization increased the difficulties of repair when these cars were off the lines of the roads which owned them. Parts were not interchangeable and often had to be telegraphed for.

In a general way the same thing was true of the locomotives in use. Complete standardization will of course be impossible until the rolling stock and engines now in use shall have been entirely replaced by standardized types. Progress has, however, been made. Some 12 standard types for freight cars have thus far been agreed upon, and it has also been decided that hereafter only six types of locomotives of two weights each shall be purchased. The parts of these various types of locomotives and freight cars will be interchangeable. Their construction will be uniform and when repairs are needed they can be made with the greatest possible promptitude.

One hundred thousand freight cars of the agreed upon types have been ordered, and it is expected that the manufacturers can commence delivering them early in September. One thousand four hundred and thirty locomotives of the new type have also been ordered, in addition to about 2,100 that had been contracted for by the railroads prior to January 1, 1918. Of the total of about 3,600 locomotives, some 1,185 had been delivered up to August 1. The equipment of all the railways December 31, 1917, included about 2,400,000 freight cars and 64,750 engines. The ratio which the newly ordered cars and engines bear to the total is not as large as is to be desired, and other orders will be placed as rapidly as the manufacturers can accept them. Just at present, however, the war department is taking a large number of the new engines and cars for use on our railroads in France, and these with the orders placed by the Railroad Administration will more than absorb the entire manufacturing capacity of the equipment and locomotive plants in the immediate future.

Capital Expenditures for Improvements and Betterments

On February 2, 1918, all lines under federal control were directed to prepare and send in budgets of improvements immediately required to increase capacity and efficiency and to promote safety in operations. The budgets submitted in response to this called for expenditures chargeable to capital account—that is, exclusive of large sums chargeable to maintenance—amounting in the aggregate to \$1,328,493,609, which, upon careful revision by the director of the Division of Capital Expenditures, was reduced to \$975,105,416. This

amount has been increased from time to time by new and unforeseen requirements, and particularly by large orders for freight cars, until the improvements definitely authorized to this date amount to \$1,151,967,240. Of this amount, \$441,604,460 is for additions and betterments, \$666,824,180 for equipment, and \$43,538,600 for construction of extensions, branches, and other lines.

Appropriations have been directed to work necessary to facilitate indispensable transportation, rather than those improvements which, while desirable and even necessary, are yet more for convenience and economy than for capacity and efficiency in the actual movement of traffic. This is indicated by the very large appropriations for equipment—almost wholly for engines and freight cars; and of the additions and betterments, much the largest item was for additional yards, sidings, etc.; next, shop buildings, engine houses, and appurtenances; and, third, additional main tracks. In view of the great necessity for conserving capital, materials, and labor for war purposes, it does not seem unreasonable to ask our people in various communities to continue to submit, during the present emergency, to inconveniences hitherto endured for lack of facilities that might reasonably be required in normal times.

Purchases of Supplies

The material and supplies annually purchased by the railroads have hitherto cost between \$1,500,000,000 and \$2,000,000,000 a year. When the carriers were in competition for traffic they were also in competition for the supplies required. This competition has been for the most part eliminated and a substantial saving has been effected as a result of the supervision over all purchases exercised by the director of the division in charge of them. He is aided by an advisory committee of three composed of the general purchasing agents of the three leading divisions of the Federal Railroad System and acts through regional purchasing committees, with headquarters in New York, Chicago, and Atlanta, to whom the larger part of the buying that is done for account of the railroads is intrusted. It is planned shortly to enlarge the advisory committee by including a representative from each regional district.

The Government Its Own Insurer

In line with the established policy of the government to insure its own risks, the Railroad Administration will become its own insurer and meet any fire losses for which it may be liable out of its own funds; a section to be known as the Insurance and Fire Protection Section has been established. In an effort to minimize losses an adequate and vigilant fire-inspection and fire-prevention service is being organized. This policy has been adopted after a careful study of the past experience of the railroad companies in the matter of insurance. While many of them in the past have carried a part of their liability uninsured, reports from all but five of the more important railroads show that during the three years ending June 30, 1917, the premiums paid insurance companies aggregated \$16,021,369, while the total losses incurred during the same period were but \$12,460,639, making an excess of premiums over losses for the three-year period of \$3,560,730. The three years under consideration included the Black Tom disaster in New York harbor, resulting in a very heavy and exceptional loss to the companies, and it is believed that a very substantial saving will be effected by the policy of noninsurance that has been adopted.

Compensation, Insurance and Pension Plan Under Consideration

Plans for the uniform and equitable compensation of injured employees or the dependents of employees who may be killed in the service of the railroads are being considered,

and it is hoped that it may also be possible to arrange for the retirement of employees upon pension at a given age, as well as to provide for their purchase of life, health, and old-age insurance at reasonable rates. Time will, however, be required to perfect these plans, which must be reconciled with the widely varying pension and insurance systems now in existence on not a few of the railroads.

Results Thus Far Secured

This comprises some of the more important reforms already applied or under immediate consideration. Their effect in increasing the efficiency of the service and enlarging the capacity of the existing facilities can not be definitely stated or approximated as yet. Many of the changes made have been effected within the last two months and under private ownership at least 60 days have been required for the compilation of informing railroad statistics. Arrangements are being made to collate and publish them more promptly, but until this can be done it is impossible to promptly and properly co-relate innovations in methods with results.

Speaking generally, however, there is good ground for believing that substantial progress has been made in accelerating the movement of traffic, employing the available equipment more intensively and running trains more nearly on time.

The number of tons of revenue freight carried one mile, commonly known as revenue ton-miles is the ultimate measure of service in railroading. Applying this measure we find that the revenue ton-miles of 94 per cent of class 1 railroads (i. e., those having an operating income in excess of \$1,000,000 per annum) was 34,250,247,814 miles in April, 1918, as against 31,464,837,365 miles in the same month in 1917. The increase is equal to 8.9 per cent. The average number of freight cars in service had increased by 5.1 per cent, being 2,387,670 in April, 1918, as compared with 2,271,359 in 1917.

The number of tons hauled per train shows an increase of 6.9 per cent, being 696 tons in April, 1918, as against 651 tons in April, 1917. The percentage of increase in the carload is even greater, being 14.4 per cent, the average carload in April, 1918, being 29.4 tons as against 25.7 tons in April, 1917. The revenue ton-miles for freight locomotives shows an increase of 7.9 per cent, being 1,125,875 in April, 1918, as against 1,045,921 in April, 1917.

Coal Movement

These figures all show encouraging progress. Just at present strenuous efforts are being made to speed up the movement of coal so as to preclude the recurrence of the distressing experience of last year. In both the production and transportation of coal 1917 was a record year. Including bituminous, lignite, and anthracite the production was 650,000,000 tons. Of this some 11,563,056 cars, containing about 558,000,000 tons, were transported by the railways. During the bad weather in January, 1918, there was a reduction of 79,131 cars in the number of cars of coal loaded and moved as compared with the year 1917. Notwithstanding the continued bad weather in February, 1918, the railroads got on their feet and increased over February, 1918, 31,250 carloads of coal. In March the increase was 46,613; in April, 73,408; in May, 84,998; in June, 88,840; and for the first four weeks of July, 113,198 cars. It will be seen, therefore, that for the last six months the increase in coal carried by the railways has been 437,976 cars of coal—equal to about 21,998,800 tons.

One of the great advantages of governmental control is that the transportation facilities of the country can be concentrated upon the quick performance of an urgent duty. The energies of the Railroad Administration are now being largely devoted to moving the coal mined as rapidly as the Fuel Administration can deliver it.

Of late cars have frequently been supplied to the coal mines more rapidly than they have been able to load them and it is probable that adequate transportation for the fuel requirements of the Nation will be available provided the coal production during the warm weather can be maintained at a point that will fully employ the cars requisitioned. The country has been led to believe that coal production is limited entirely by transportation and that any shortage is due to the railroads. This is erroneous. The maintenance of an adequate coal supply depends in the first instance upon production which in turn is restricted by shortages of labor and other causes aside from transportation.

Volume of Traffic

Some idea of the volume of the eastbound freight traffic is to be had from a recent report of the Pennsylvania, which shows that 250,000 freight cars moved past Columbia, Pa., during the month of June. Practically all the through east and west bound freight is routed via this point. The average daily movement was 8,544 cars or an average of about one car every 10 seconds. On June 20, 9,531 cars passed Columbia, exceeding all previously reported one-day movements on the Pennsylvania and establishing what is believed to be the world's record for the greatest number of freight cars that ever passed a given point in 24 hours.

Similar reports are being received from other districts. The reports from the Eastern District indicate that the average anthracite and bituminous coal dumped at tidewater ports per calendar day in January was 2,233 cars. By May this average had risen to 3,345 cars. The average daily movement of anthracite and bituminous coal into New England in February was 794 cars per day. By May it had risen to 1,109 cars. On January 1 there were on hand at North Atlantic ports approximately 41,000 cars of export freight at piers, and on the ground. By the 8th of May this had been reduced to approximately 28,000 cars, since which time a further reduction has been affected. The movement of coal via the Great Lakes shows an increase of 26 per cent over last year in cars dumped in vessels up to the end of May this year, but it is hoped that a still greater gain may be shortly secured.

Troop Movement

For many reasons it is not perhaps in the public interest that a complete statement of the traffic that has been handled for the government should be published at present, but some idea of the service performed may be had from the statement that from May 1, 1917, to July 31, 1918, about 6,455,558 troops had been moved on orders from the war and navy departments. Of this number 4,304,520, or nearly 68 per cent were carried between January 1 and July 1, 1918. These figures do not include soldiers, sailors, and officers traveling at their own expense.

Transcontinental Lumber Movement

Another movement of government traffic that it is permissible to mention is the shipment of lumber for ships, aeroplanes, and other government requirements, excluding railways, across the continent. Some 177,000,000 feet were shipped from the Pacific coast to Atlantic or intermediate points in this way between January 1 and July 18, 1918, and when speed was essential delivery on the eastern seaboard has been frequently made within 15 days after shipment from the Pacific coast.

Mention is also made in the report of the formation of the Bureau for Suggestions and Complaints, the universal mileage book, the advances to the railroads of sums necessary for the payment of authorized dividends and the redemption of maturing obligations, the taking over of the Pullman service, the consolidated express service the introduction of through waybill, the harmonizing of accounting systems and the

establishment of a clearing house for the settlement of inter-corporate balances, the order directing that suits against carriers must be brought in convenient districts, the abolition of car mileage and per diem rentals, the simplification of interline passenger revenue accounting, the co-ordination with other governmental departments, the creation of a safety section, and the prohibition of the sale of intoxicants on trains and in railroad restaurants and stations.

In describing the organization it is stated that while the regional directors are, of course, subject to the authority of the director general, as they are all men of experience and distinction as railway executives "the policy is to give them large discretion and thereby free the members of the central staff for a more careful study of the important questions that come before them and the essential administrative work they must perform." The policy is said to be to keep the Washington organization as small as possible and avoid the creation of an unwieldy and expensive central administrative bureau.

The description of the regional organization refers to the individual railroads as "divisions." An explanation of the plan for the grouping of the eastern lines gives the following reason:

"Thus it has been deemed wise to put the Pennsylvania lines and the Baltimore & Ohio lines east of the Ohio river in the Allegheny District, and those west of the Ohio river in the Eastern District, which contains the whole of the New York Central Division. This course has been followed in pursuance of a policy that contemplates the preferential use of the more northerly trunk lines for fast through freight and passenger traffic, between the Chicago District and the East, thereby releasing the lines in the Allegheny District for the distribution of the enormous traffic that originates in the Pittsburgh District where congestion of local and through freight in the past has created some of the most costly and exasperating blockades that have been known in the history of American railroads."

In conclusion Mr. McAdoo acknowledges the services of the officials and employees who "have worked with such loyalty and zeal to accomplish what has already been done that it is a genuine pleasure to make acknowledgment of their splendid work. It is a constant satisfaction to be associated with them. You can rely upon their patriotic enthusiasm and alacrity in the work of winning the war, in which they as well as the soldiers at the front have enlisted with such laudable determination and patriotism."

RAILWAYS IN "GERMAN" AFRICA.—The total length of the railways in the formerly German colonies in Africa is about 2,488 English miles, of which 757 miles are in East Africa, 328 miles in the Camerons, 201 miles in Togoland, and 1,201 miles in South-West Africa. The standard gage of these lines is one meter, but in all cases where they are in the vicinity of the South African lines the Cape gage of 3 ft. 6 in. has been adopted.

TRAVEL CONCESSION TO THE WOUNDED.—The British Ministry of Pensions announces that the Railway Executive Committee have issued to all railway companies instructions regarding the carriage by rail of invalid or mechanical chairs in possession of men who have been disabled as a result of injuries received during the war. Bath, invalid, mechanical, or other chairs accompanying disabled soldiers and sailors will be charged at 25 per cent of the ordinary public rate, with a maximum charge of 2s. (\$.48). This arrangement will apply to discharged men in civilian clothes as well as to men in uniform. When men are in civilian clothes they must produce proper credentials to the railway authorities. The concession has also been granted to officers.—*Railway Gazette, London.*

Officers of the North Western Region

R. H. Aishton,
Regional Director



M. J. Gormley,
Assistant Regional Director



J. G. Woodworth,
Traffic Assistant



L. C. Gilman,
District Director Puget Sound District



L. S. Carroll,
Chairman Regional Purchasing
Committee



J. H. Brinkerhoff,
Terminal Manager Chicago Switching
District



A. C. Johnson,
Chairman Western Freight Traffic
Committee



P. S. Eustis,
Chairman Western Passenger Traffic
Committee



H. J. Bell,
Regional Supervisor of Safety

N. W. Region; a Group of Well-Managed Roads*

Northwestern Railway District Ranks High in Earning Capacity and Operating Efficiency

IT IS NOT SURPRISING that the Northwestern railroad region, which includes roads developed by Hill, Houghitt, Harriman and other capable executives, should compare favorably with the rest of the country from the standpoint of operating efficiency and net revenues. Comprising about one-fifth of the area of the country, with one-fifth of the operated railway mileage and one-seventh of the rolling stock, this territory produces approximately one-fourth of the net revenues from railway operation of the roads in the United States.

Laying aside the overlap of the various regions, this district comprises Wisconsin, one-tenth of Illinois bordering on Wisconsin, the upper peninsula of Michigan, all of Minnesota and North Dakota, three-fifths of Iowa, one-half of South Dakota, five-sixths of Montana, one-third of Idaho, two-thirds of Oregon and all of Washington, or approximately 593,000 sq. miles. The roads under federal control in this region operate over 51,000 miles of line. While the railway mileage and area of the territory are in approximately the same proportion to the total mileage and area of the country, the equipment of the railways is considerably less in relation to the total equipment of all roads. The northwestern lines own about 340,000 freight cars, or 14 per cent of the freight car equipment in the United States, 10,000 locomotives, or about 15 per cent of the total number in the country, and 8,000 cars in passenger service, or 14 per cent of all passenger equipment.

As previously indicated, the northwestern lines compare more favorably with the remaining roads in the country from the standpoint of operating income. According to the latest statistics published by the Interstate Commerce Commission, the operating revenues of the carriers included in the Northwestern region amounted to about \$530,000,000, or 18 per cent of those of all roads; operating expenses were \$323,000,000, or about 15 per cent of those of all American railroads, while net revenues from railway operation were \$207,000,000, or 24 per cent of those of all lines.

A Region of Relatively Prosperous Lines

In general, it may be said that the northwestern railroads are, and have been, prosperous as compared with other American lines. This prosperity is due in large measure to good railroading, not only in the sense of efficient operation but also of foresight and initiative in locating and constructing extensions to open the way for further development of the country. In fact, the railway companies played a large part in building up the Northwest. They projected lines far into the unpeopled wilderness, and then attracted settlement by observing a paternalistic policy toward newcomers. The extent to which he opened up untapped territory and fostered development won for James J. Hill the name of "empire builder."

District Consists Mainly of a Few Large Roads

The Northwest region consists mainly of a few large systems. There are 10 roads with an operated mileage of over a thousand miles each, and these constitute 88 per cent of the entire mileage of the region. In order of length they are the Chicago, Milwaukee & St. Paul, the Great Northern, the Chicago & North Western, the Northern Pacific, the

Minneapolis, St. Paul & Sault Ste. Marie, the Oregon-Washington Railroad & Navigation Co., the Chicago, St. Paul, Minneapolis & Omaha, the Minneapolis & St. Louis, the Chicago Great Western and the Southern Pacific lines north of Ashland, Ore. In general, there has been, under government control, little division of northwestern lines for operating purposes. Likewise, there have been no combinations of important lines or sections thereof, under common federal managers such as took place in other regions, and particularly in the Southwest. All the large northwestern roads have their own separate managements under federal control, thereby preserving their identity.

The Trend and Character of Traffic

The ruling direction of the lines in the Northwestern region is east-and-west. Three of the largest roads, namely the St. Paul, the Great Northern and the Northern Pacific, connect the North Pacific coast with the Middle West. Among the other prominent roads, the North Western system penetrates far into the West and receives much transcontinental traffic from connections; the Soo follows a northwestern route from Chicago through the Twin Cities to Canada where it connects with the Canadian Pacific, of which it is a subsidiary; and the Great Western connects Chicago with the Twin Cities, Omaha and Kansas City.

The direction of the lines conforms with the trend of traffic which is governed by the economic character of the region. The Northwest and the Far West produce raw materials which are transported to manufacturing centers of the Middle West and East. West-bound traffic consists largely of manufactured products and merchandise to supply the needs of the agricultural, lumber and mining regions of the Northwest or for shipment beyond to supply the trans-Pacific trade. In addition, large shipments of coal go to the West, which produces only a small percentage of its own fuel supply.

By far the heaviest traffic of the nine largest lines is in products of mines. In the fiscal year ended June 30, 1916, these roads hauled over 68,000,000 tons of this class of freight, which was 37 per cent of their total tonnage. Ore alone accounted for 17 per cent of the total freight tonnage for the year. The North Western and the Great Northern handle the greatest part of this traffic, with a tonnage in excess of 12,000,000 each. The heaviest ore carrier in the region, however, is the Duluth, Missabe & Northern, a relatively short line not included in the list of large roads. In 1916, this railway moved 20,580,000 tons of ore. Another important ore carrier is the Duluth & Iron Range with a tonnage of nearly 11,000,000. Coal and coke traffic is also heavy. In 1916 the nine largest northwestern lines moved 24,565,000 tons of coal and coke, or 13 per cent of their entire freight tonnage for the year.

Agriculture is second to mines as a source of tonnage. In the fiscal year 1916 the nine largest roads hauled 40,755,000 tons of agricultural products, or 22 per cent of the entire tonnage handled during the year. Of this traffic grain is the most important single item, 27,260,000 tons of this commodity having been transported in 1916, or 15 per cent of the entire freight tonnage of the roads. The North Western led as a grain carrier, with 5,477,000 tons, the St. Paul was second with 5,063,000 tons, and the Great Northern and Northern Pacific were third and fourth with 4,913,000 tons and 3,435,000 tons, respectively. Forest products are third

*This is the third of a series of articles describing the characteristics of the seven operating regions into which the railways of the United States are now divided.

in rank as creators of tonnage. In 1916, 29,560,000 tons of lumber and other forest products were transported, or 16 per cent of the entire freight tonnage of the nine roads. The tonnage of manufactured products in the fiscal year 1916 amounted to 23,650,000, or 13 per cent of all the freight handled, while the tonnage of animal products amounted to 7,236,000, or about 4 per cent of the total tonnage of the nine lines.

Traffic Density of Region Low

The northwestern region is one of great distances and of long hauls. This is particularly true of the three transcontinental lines. The average haul of revenue freight on the Northern Pacific in 1916 was 334 miles; that of the Great Northern was 270 miles, while that of the St. Paul was 262 miles. The traffic density is low compared with that of eastern lines. The ton mileage of revenue freight per mile of road averages between one-fifth and one-sixth of that on the roads in Eastern Trunk Line territory.

Previous to government control there was keen competition for freight in the Northwestern region. Between Chicago and St. Paul, for instance, there are six separate direct routes, and there were likewise six competing lines between Chicago and Omaha. There was also a strenuous struggle for transcontinental traffic which was shared in by the Great Northern, Northern Pacific, St. Paul and the North Western in conjunction with the Union Pacific system. It cannot be said of this region as it can of the Allegheny operating district that any one road dominated traffic. On the contrary, all of the larger northwestern lines were strong and won their fair share of business.

Competition was no less acute in the passenger field. Exceptionally well-equipped trains were operated between the large cities of the region and particularly between the Middle-West and the coast. This policy naturally led to considerable duplication of train service which was one of the first conditions to attract the attention of the Railroad Administration in its campaign to conserve transportation facilities during the war. Accordingly, last May two northbound daily passenger trains and three southbound trains were removed from the service between Chicago and St. Paul. Three daily trains each way were discontinued between Chicago and Omaha and between Portland and Seattle, and like reductions were made between other cities. Of the reductions in passenger train service made at this time the greatest on any individual road in the region was on the St. Paul. The service of this line was reduced to the extent of 1,012,000 passenger train miles per year. The reductions on the North Western amounted to 816,000 train miles per year; on the Omaha, 299,000; on the Northern Pacific, 236,000, and on the O. W. R. & N., 179,000.

Operating Economies Introduced by Regional Staff

The staff of the Northwestern region is practically the same as that of the old Western region and has the distinction of introducing successfully new operating methods made possible through unified control of the railways. The train-lot system of handling freight and the marked economies effected through the short routing of cars were covered in considerable detail in articles of the *Railway Age* of May 24 and July 12.

The officers of the Northwestern region are now making an intensive study of possible economies in the handling of l. c. l. freight. The sailing day plan is being introduced in all the larger cities and merchandise is being consolidated over specified routes for designated destinations in order to insure the full utilization of cars and to eliminate unnecessary transfers. The staff of the region is also making a careful investigation of the terminal situation. Each large terminal has been put under a single manager and switching and freight-house facilities are being consolidated where prac-

ticable. The Northwestern region does not contain the network of terminals which one finds in the East, and, as a result, has been generally free from congestion. It does, however, contain the greatest railroad center in the world, namely Chicago. Such congestion as has been experienced has originated in that city. Railway operation in the Chicago switching district constitutes a most complex problem which is now being studied by the Railroad Administration.

The Regional Officers and Their Qualifications

The regional director and his staff are all men thoroughly familiar with the Northwest by virtue of years of experience on roads in that territory. The major officers of the region are R. H. Aishton, regional director; M. J. Gormley, assistant regional director; J. G. Woodworth, traffic assistant; L. S. Carroll, chairman of the regional purchasing committee; H. J. Bell, supervisor of safety; L. C. Gilman, district director of the Puget Sound district, and J. H. Brinkerhoff, terminal manager of Chicago terminal district. In addition to these regional officers there are several officers of the former western railroad region who still retain their jurisdiction over the roads in all three western regions. These include A. C. Johnson, chairman of the western freight traffic committee, and P. S. Eustis, chairman of the western passenger traffic committee, both of whom have headquarters in Chicago.

R. H. Aishton, regional director of Northwestern railroads is an executive whose rise has been particularly rapid in the last few years. After five and a half years as vice-president in charge of operation and maintenance of the Chicago & North Western, he was elected president in May, 1916, to succeed W. A. Gardner, deceased. In the spring of 1917 following the creation of the Railroads' War Board, he was appointed chairman of the central department district committee. His work on this committee put him in close touch with operating conditions on all the roads in the Central West and gave him experience that proved invaluable to him when, in 1918, he was placed in charge of all lines under federal control west of Chicago and the Mississippi river, as regional director of the Western region. When the western district was later subdivided he retained the northern third as regional director of the Northwestern region.

M. J. Gormley, assistant regional director, has been closely associated with Mr. Aishton as his assistant for many years. He first entered railroad service with the North Western at Eagle Grove, Iowa, in 1893, and was employed in various capacities in the track and building departments of that road for four years, following which he became stenographer to Mr. Aishton, who was then division superintendent at Boone, Iowa. He later accompanied Mr. Aishton to Chicago when the latter was appointed general superintendent. After service as chief clerk and five years as trainmaster he again became chief clerk to Mr. Aishton, then general manager. He subsequently served with Mr. Aishton as chief clerk and assistant to the vice-president and assistant to the president. During 1917, while Mr. Aishton was chairman of the central department committee of the Railroads' War Board, Mr. Gormley acted as general agent of the American Railway Association at military headquarters, Chicago, where he was responsible for the proper handling of troops and military supplies in that territory. When the railroads were taken over by the government and Mr. Aishton was placed in charge of the Western region as regional director, Mr. Gormley was appointed operating assistant. When the Western region was divided into three parts and Mr. Aishton was given charge of the Northwestern operating district, Mr. Gormley was formally given the title of assistant regional director.

J. G. Woodworth, traffic assistant to the regional director of northwestern railroads, has been for 13 years traffic man-

ager and vice-president in charge of traffic of the Northern Pacific. Thoroughly familiar with rates and rate structures in the Northwest, he was well fitted to assume his present duties.

L. S. Carroll, chairman of the regional purchasing committee of the Northwestern region, has for eighteen years been purchasing agent of the Chicago & North Western, with which road he has spent his entire railroad career. He still retains his position as purchasing agent of the North Western.

H. J. Bell, regional supervisor of safety, has been active in safety work on the Chicago & North Western for a number of years and was safety inspector at the time of his appointment to the Railway Administration. He has also been active in the National Safety Council and at present is chairman of the Steam Railway Section and a member of the executive committee of that organization.

Luthene C. Gilman, district director of the Puget Sound district in charge of operation in Oregon and Washington, is thoroughly familiar with transportation conditions in that

territory by virtue of years of experience there. Before taking his present position he was president of the Spokane, Portland & Seattle, the Oregon Trunk, the Pacific & Eastern, and the Spokane & Inland Empire with headquarters at Portland, Ore.

James H. Brinkerhoff, terminal manager of the Chicago terminal district, has been general superintendent of the Belt Railway of Chicago for the past five years, during which period he acquired a detailed knowledge of operating conditions in the Chicago terminals.

A. C. Johnson, chairman of the western freight traffic committee, with headquarters at Chicago, has been in the traffic department of the Chicago & North Western for nearly twenty years.

P. S. Eustis, chairman of the western passenger traffic committee, with headquarters at Chicago, has had 42 years of railroad traffic experience in the West. For 14 years he was general passenger agent of the Chicago, Burlington & Quincy, and since April, 1902, has been passenger traffic manager of that road. He was appointed chairman of the western passenger traffic committee early this year.

Railway Executives Advisory Committee's Report

Unqualifiedly Recommends the Acceptance of the Contract As Finally Approved by Director General McAdoo

THE FOLLOWING is the full report made to the railroad companies by the Railway Executives Advisory Committee on the standard form of contract between the government and the railroads. The report is signed by the chairman of the committee, Thomas DeWitt Cuyler.

The federal control act was approved by the President March 21, 1918, and immediately thereafter the Railway Executives Advisory Committee undertook, through its counsel, to negotiate with the representatives of the director general a standard form of contract between the government and the railroads. After more than five months of continuous negotiations, I am now able to lay before you the results. These are embodied in a draft of proposed "standard clauses," printed under date of September 5, 1918, and promulgated as the offer of the director general to the railroads. With this draft, I also transmit to you the reports of the law committee, which has been charged with the direct responsibility of conducting the negotiations. These reports, together with the draft of proposed contract, will give you an adequate conception of the course of the negotiations and of the results attained. You will, of course, appreciate that the problem was not an easy one, either for the representatives of the government or for the representatives of the railroad companies.

For more than 30 years every conceivable question relating to railroads had been the subject of political agitation and discussion and of sharp differences of opinion. There had thus grown up two distinct schools of thought, neither of which was willing to measure its conception of justice to the railroads by the standards of the other. Consequently the public official who was to act for both, had a wide divergence and acute conflict of opinion to reconcile and was confronted by a most delicate and difficult task. The problem was one not alone of business judgment and expediency. It had to be determined with due regard to a variant and critical public opinion.

Charged with these delicate and important responsibilities, the representatives of the government had a right to expect the utmost frankness and a broad conception of justice on

the part of the railroads. To indicate how this situation was met by our representatives, I make the following quotation from Mr. Thom's [A. P. Thom, counsel for the committee] letter of transmittal of the latest draft, which indicates the spirit which actuated Mr. Thom and his associates in the negotiations and their views and advice as to the result:

"At the outset we were confronted by the necessity of establishing with the representatives of the government a basis for successful negotiations. We realized that we could expect to make no progress if we adopted an attitude of narrow, exacting and irritating contentiousness, nor unless we established in the minds of the government conferees respect for the legal and moral soundness of our proposals and for the justice and reasonableness of our contentions. We did not conceal from ourselves the difficulty of securing from any governmental body the consideration of questions relating to railroads free from the prejudices and antagonisms engendered by 30 years of political agitation and discussion. We kept constantly in view the fact that the possession and use of our properties had, for the period of federal control, gone from us, and that the only chance, of practical value to us, to secure compensation from the government, depended on the federal control act, approved March 21, last, and on these negotiations. We felt it a very solemn duty to prevent the destruction incident to a rejection of the act as unconstitutional and to escape the chaos of litigation, in place of agreement, under it.

"We knew that the creation of an *impasse* between the government conferees and ourselves might eventuate in one or other of these results. We likewise knew that in the negotiations the railroads did not occupy a plane of equality with the government; that, in any matter of radical and irreconcilable difference, the public would be likely to accept the government's, rather than the railroads', point of view, and, under the patriotic impulse growing out of the war, would in all probability view with suspicion and would earnestly condemn any demands of the railroads which were rejected by the government as extreme and as indicating an unwillingness on their part to participate in the general sacrifice which the

war is imposing on every individual and on every business interest.

"We have, therefore, tried, throughout the negotiations, while adhering to a wise insistence on matters regarded by us as essentials, to avoid all unnecessary friction and, no matter how wide the differences at any moment were, to keep them within the possibilities of continued consideration and negotiation. Of course, matters of such momentous consequence and of such infinite detail, have called for great patience both on the part of the government conferees and ourselves. There is hardly a line in the proposed contract which has not been the subject of careful consideration, thorough discussion and deliberate negotiation. For more than five months we have been engaged almost daily on the matter. We have been obliged at times to put aside a special subject of negotiation as apparently unattainable, with the purpose of coming back to it at a later and more favorable opportunity. We have been good naturedly accused by the representatives of the government of using a concession made by them to us only for the purpose of pinning the matter down at that point and making it a new point of departure to secure additional concessions. We have been forced to admit the justice of this accusation, for naturally in many cases we have been obliged to depend on a growing and gradual appreciation of the justice of our views and of the validity of our contentions.

"In this way we have secured the proposal of a contract."
[See *Railway Age*, September 6; page 435.]

Some Desirable Features Not Included

"It is true the contract as proposed does not contain a number of features which are desirable from the standpoint of the railroads. For example:

"(a) It does not reserve to the carriers a right to recover for a diversion of their traffic or a disruption of their working organization during federal control.

"As you know, we have never thought it possible, under the law, to sustain the proposition that we are entitled to such a reservation. In our opinion the agreed amount of compensation in contemplation of law covers these elements of damage, and, if we are not satisfied with the amount of the compensation we can get by agreement, we are at liberty to go into the Court of Claims where claims of loss from these causes will be considered and an award made which will recognize them. If we prefer an agreement, the President cannot, in cases which are not exceptional, give us more than the maximum prescribed by the statute, no matter how just our claim for a greater sum. In either event, the compensation, whether agreed upon or awarded by a court, covers and, in contemplation of law, pays for damage from loss or diversion of business and also from disruption of the company's working organization, which is of vastly more importance, if the properties revert to their owners, than the diversion of traffic. The legal question here involved has been referred by the railroad Administration to the department of justice and Solicitor General Davis has given a careful opinion, which is in harmony with the legal conclusions reached by the law committee and above stated.

"(b) It would be very desirable, from the standpoint of the railroads, to set a limit on the power of the director general to order additions and betterments for the company's property at its expense. The practical difficulty is that the power is conferred by the statute, and is not dependent upon contract. The director general declares that he does not feel it consistent with his duty as a public official to attempt to contract away a discretion in respect to so important a matter which Congress deemed it necessary in the public interest to confer upon him.

"(c) The most dangerous situation which, in our opinion, will confront the railroads at the end of federal control is a

large accumulation of indebtedness represented by demand or short term paper.

"With this danger in mind, we endeavored to secure the inclusion in the contract of a provision substantially as follows:

It will be the policy of the director general, so far as in his judgment consistent with the interest of the government, and as may be reasonable in view of the company's financial condition, to facilitate before the end of federal control the funding of the obligations of the company to him in such a way as to place the company upon a sound, easy and safe financial basis.

"While it was not considered appropriate to make in the contract a declaration of policy on this subject, we have every reason to believe that the director general is fully alive to the necessity for dealing helpfully and constructively with this financial problem.

"With the results now known of the negotiations which have been so long pending, the law committee must meet the responsibility of advising either the acceptance or the rejection of the proposed 'standard clauses of the contract between the government and the railroads,' as set out in the print of September 5, 1918. We approach the subject on the assumption that it is proposed to pay, except in the cases for which the statute contemplates a more liberal treatment, the maximum amount permitted by the statute, namely, the average railway operating income for the three years ended June 30, 1917.

"On the one hand, the railroads are confronted with large discretionary powers in the government which we cannot get rid of or subject to reasonable limitations in the contract, and which, if unwisely or unjustly exercised, are great enough to result in very hurtful, or even destructive consequences to these properties. In estimating these uncertainties, we must remember that our government is engaged in a great war; that all of our people are expected to make sacrifices and take chances; that the government has, for war purposes, been vested with unprecedented discretionary powers in respect to every interest, individual and corporate; and that it is, in any event, our government, of which we are entitled to expect that there will be no wanton exercise or abuse of power.

"On the other hand, we must realize that we have already lost the possession and use of our properties for the whole period of federal control; that at present we are without any assurance whatever of compensation; that our hope of compensation must be based on this statute, or on another appeal to Congress, or on an attempted litigation outside of this legislation.

Appeal to Congress or Courts Inadvisable

"We cannot escape the conclusion that a new appeal to Congress is beset by such dangers of unfortunate and disastrous consequences as render that course in the highest degree unwise, and that litigation, either under the federal control act or outside of it, would involve such uncertainties and delays, and such impairment of security values during the period necessary to carry these cases through the courts, as to place litigation clearly outside the range of practical remedies. We cannot become responsible for the ruin likely to be the outcome of litigation. In this case a resort to the courts is no remedy.

"In our judgment we are impelled, by every consideration of prudence and wisdom, to find a solution of our problems in an agreement. We think it fair to assume that, after five months of unremitting effort and negotiation, and after the questions at issue have been carried before and personally passed on by the director general after argument, the standard clauses now presented embody all we can reasonably hope—certainly within any reasonable time—to secure by agreement, and we, therefore, without reservation advise the acceptance of the proposed contract."

"The Railway Executives Advisory Committee has given,

as the importance of the subject required, earnest consideration to the draft of the proposed contract and to the reports of counsel. The committee fully appreciates all that has been, or may be, said as to the extent and unrestricted character of the powers conferred upon the railroad administration by the federal control act; as to the disorganization of business and of the working personnel which may and probably will follow a period of prolonged governmental control and operation; and as to the financial problems which will have to be met in the period of recovery and reconstruction afterwards. These considerations, however, no matter how important, must not cause us to lose sight of the great and controlling facts of the situation.

"We must not forget that the powers referred to were conferred by an act of Congress and cannot be gotten rid of except by a judicial declaration that the act is unconstitutional. But the act furnishes the only method yet devised to secure the railroads compensation for the possession and use of their properties, which have gone from them for the period of federal control. They are, therefore, interested beyond all others in having the act stand and in avoiding all assaults upon its validity.

"Nor must we forget, in respect to the claim of damage for disruption of business and disorganization of the working personnel, that the government's contention holding that such damage is, in contemplation of law, included and paid for in the amount of agreed or awarded compensation, is sustained by the highest legal authority of the government itself and by the unanimous opinion of our own legal representatives. These lawyers have attained their present positions in competition with the entire American bar, and their opinion cannot be lightly disregarded. A governmental contention, sustained by such convincing authority, can scarcely be considered as palpably unjust or unsound. Controversy in respect to it is not inviting. Even if the claim for damages were valid, it would be of little practical value, because, in the first place, of the difficulty of proof, and, secondly, if a judgment were obtained, of securing an appropriation from Congress to satisfy it.

"The alternative of receiving, pending litigation, 90 per cent of the estimated standard return, with the privilege of having the amount of the compensation determined in the Court of Claims does not, in the opinion of this committee, afford a practicable remedy. In the first place, by the terms of the act, it is entirely within the discretion of the director-general whether or not to allow the 90 per cent. If it be accepted, the acceptance constitutes also an acceptance of all the terms of the act. If the director-general does allow it, in pursuance of his discretion, it becomes subject to any offset or deduction the government may at any time elect to make to reimburse itself for debts due it for additions and betterments or otherwise.

"It is hardly to be expected that the director-general will pay the full 90 per cent if he is to be confronted with claims to be asserted in litigation against him for unknown amounts.

"Very few of the companies can stand a deduction of 10 per cent, even temporarily, on their standard return without serious embarrassment. And the time required to carry several hundred of these complicated cases through the courts will cause infinite delay in arriving at a final conclusion, and meanwhile the whole financial structure of the railroads will be subjected to a period of most harmful uncertainty with its destructive consequences.

"The financial problems which will have to be met when the properties are returned to us must receive serious consideration. They, however, naturally arise out of the situation, except as they are, in some degree, the outgrowth of the excessive powers conferred upon the railroad administration by the act of Congress. As these powers were not conferred for purposes of oppression, but were deemed necessary for the

efficiency of the railroads in a time of great national peril, we must assume that they will be fairly and considerably exercised. There is nothing in the declared attitude nor in the record of those responsible for the administration of the railroads, to justify apprehension of a reckless disregard of justice or of sound financial principles. Indeed it may be doubted whether the financial uncertainties which confront the railroads are, under the conditions mentioned, notably greater than those which every other business interest and every individual has to face in these times of universal danger.

"We must remember that the nation is engaged in a great war. War cannot be successfully conducted without concentration of power. When, in the national interest, every household is entered by the national authority and the treasures of its manhood are commandeered for the national safety and defense, no business interest can expect or desire to stand immune and demand absolute safeguards before it is content to assume its share of the risks and sacrifices which in fairness should be universal.

The Advantages of the Contract

"It is true that the railroads have been taken from their owners for the period of the war and a reasonable time thereafter. But Congress promptly passed an act to assure the owners of compensation for the possession and use of their properties thus taken over. We are offered a contract guaranteeing us an amount of compensation equal to the best results we could ourselves secure from the management of our properties on the average during a test period of three years. It cannot be denied that we are thus relieved, to an appreciable extent, of business risks and uncertainties, with which war conditions had confronted us.

"In the contract we are assured that, no matter how great our indebtedness to the government for deferred maintenance which we should have, but did not, put upon the property while we were charged with the responsibility of operation, or for additions and betterments which we should provide for our properties to meet our public obligations, the government will not exact payment for itself until after our corporate organization is supported and our sinking funds, taxes, rentals and interest (which together may be classed as our current mortgage obligations) are provided for.

"It gives us the government's obligation to maintain our properties during federal control up to the same standard we ourselves adopted when we were charged with the duty, and to return them at the end of federal control in like good order and condition.

"It provides remedies by means of which we may recover for any loss sustained through an ill-advised governmental requirement as to additions and betterment expenditures.

"It gives us guarantees against forfeitures and loss arising out of contracts or duties violated because of federal control or other government action or omission.

"It creates a working system of accounting and payments, of supervision and inspection, and methods and details for the restoration of our property and the payment to us of debts at the end of federal control.

"It is needless to undertake to recite all the contract provisions or to go into them more in detail. The proposal of the government sets them out in a way in which they can be readily understood and from which their merits or demerits may be readily judged.

"It does not give us in the way of contract protection all that we deem ourselves entitled to have, but the matters not conceded to us lie within the region of a fair difference of opinion and are negligible in comparison with the larger interests which have, to a substantial extent, been safeguarded.

"We have the choice between the acceptance of this contract and the guarantee it gives of immediate compensation, on the one hand, and its rejection and a resort to litigation on the other. This committee cannot regard litigation, with its

attendant uncertainties and delays, as a practical remedy in the circumstances, and cannot consent to become responsible for the disorder in our national finances and the weakening of the nation's financial power which would inevitably follow. If there is to be litigation the responsibility for it must rest elsewhere.

"In the opinion of this committee, enlightened self-interest and the dictates of patriotism alike require the acceptance of the proposed contract, and the committee without doubt or hesitation so advises."

Employers Asked to Co-operate in the Selective Draft

PROVOST MARSHAL GENERAL CROWDER has addressed a statement to employers throughout the country, enlisting their cooperation in connection with the classification of the men who will register September 12, in part, as follows:

The time has come when I must address to you some recommendations as to your share of responsibility in the classification of the new registrants under the selective service act. I have noticed, in the general expressions of the public attitude which reach this office, two frequent features which lead me to the present comments. One of these features is the belief that the process of awarding deferred classification to a registrant requires merely the filling out of the questionnaire, and that the selective service boards will perceive the propriety of making the deferment, without the assistance furnished by the registrant's formal claim indicating the deferment desired. The other feature is the employer's failure to realize his responsibility to intervene in aiding the board's determination, and therefore to inform himself fully on all the considerations which should affect the decision as to deferment. Both of these features are due to a single larger fact, viz., a failure on the part of many to reflect on the industrial considerations governing deferred classification.

1. As to the first mentioned belief, it must be pointed out that if it were universally acted upon, the process of classification would be seriously hampered and delayed. Some one *must* indicate that the individual case is one which should arrest the special attention of the boards in respect to the registrant's occupational status. The boards do not possess a superhuman omniscience. Nor are they permitted by circumstances to devote unlimited time to the search of questionnaires for possible grounds of claim. In 1917, out of more than 3,000,000 registrants called, only 140,000 filed occupation claims, or 4.7 per cent; thus 95 per cent of all registrants raised no question of such deferment. Under the questionnaire system the exact scrutiny of every page of this 95 per cent of questionnaires presenting no occupational claims would have been an intolerable expenditure of time, involving a delay fatal to the speed and decisive action necessary for filling the army.

The boards will do all that they possibly can, on their own initiative, to reach a just decision by a complete examination of the questionnaire even where no claim is expressly made. A registrant is therefore at liberty, if he sees fit, to trust to the scrutiny of the boards to discover the necessity for his deferment. Nevertheless, the boards will welcome and will need all the aid that can be furnished by the indication of a claim made for deferment. With this aid, the process will become a simple and speedy one. Time and labor will not be wasted on needless search; and ample time will be gained for thorough attention to those cases explicitly raising a question of occupational deferment.

But who is to make that claim? Ordinarily, the registrant himself will indicate the claim on his questionnaire. But if, through mistaken chivalry, he should fail to do so, another

may make it for him. In industry, agriculture, or other occupations, this other person will naturally be his employer or some other representative of his associated group. And this brings me to the second feature above mentioned.

2. Why should the employer, or other third person, in such cases, make the claim? Because the employer in this situation represents the Nation—because (in the statutory phrase) "the maintenance of the military establishment or of national interest during the emergency" requires that some well-advised third person should look after that national interest, which the registrant himself may not have sufficiently considered.

It is at this point that I wish to address to employers (and other representatives) the suggestion that they charge themselves, more systematically than hitherto, with this responsibility. I have above referred to such third persons as "well-advised," and this is the place to emphasize to employers the importance of making themselves well advised for the execution of this duty.

How many employers, having charge of some industrial or other occupational group, have hitherto taken pains to inform themselves systematically which of their employees are registrants and which are not? How many have studied carefully the required conditions for occupational deferment, as laid down in the President's regulations pursuant to the statute? How many have made it a point to survey their entire plant so as to single out the really indispensable individuals? With the oncoming of a more extensive registration, an even larger outlook is necessary. The general industrial conditions, the supply of skilled men in the industry at large, the possibilities of training substitutes, the availability of women workers—these are some of the considerations which bear directly on the need of occupational deferment as related to the need of the army.

Moreover, it is often forgotten that the selective draft is only one element in the depletion of a particular industry's man-power. A second and large element is found in the voluntary withdrawals for enlistment; how large this is may be seen from the circumstance that the total inductions by draft have reached some 2,000,000, while the total enlistments in army and navy amount to some 1,400,000—nearly three-quarters as many. A third element, very large, but unknown as to its precise extent, has been the transfer of labor power from one industry to another, i. e., into the distinctively war-industries offering the inducement of higher wages. How relatively small, in actual effect, has been the effect of the selective draft is seen in the fact that, for all the occupations represented in the 8,700,000 classified registrants of January, 1918, the percentage of the entire industrial population represented by the Class I registrants amounted to only 6 per cent. It ran as low as 3 per cent for some occupations, and correspondingly higher for some other occupations; but the national average was only 6 per cent. Any notably larger depletions in particular industries must therefore have been due, partly to enlistments, and in probably greater degree, to voluntary transfers into other industries.

These other influences are therefore to be kept in mind by employers and others, in weighing the question whether the best solution, in the national interest, is to ask for the deferment of individuals or groups of men. Such deferments may assist the immediate situation in the particular establishment; but they merely force the army and the navy to seek elsewhere for the same number of men thus deferred. The quantitative needs of the military forces are known and imperative; and any given quantity of deferments will ultimately have to be made up by the depletion of some other occupation. Thus, it becomes the employer's duty to consider these largest aspects of deferment, in seeking that solution of his own problem which best comports with the national interest.

My present object is to urge upon employers the duty and responsibility of becoming well advised in all these matters;

of equipping themselves with full information as to the extent to which their particular establishment is affected by the liability of registrants to military service; of observing the extent to which other influences of depletion have affected it, and the degree in which other methods of supply can relieve that depletion; and of laying these facts and other pertinent ones before the industrial advisers now to be placed at each district board, to the end that those individuals or groups who are indispensable and irreplaceable would receive deferment,

whether or not they have made claim for it, and that the army and the navy should not be deprived of its proper supply of man-power by ill-considered deferments not absolutely demanded by the national interest.

General Crowder has issued complete regulations for the handling of claims for deferred classification for industrial reasons and has also announced that the first calls will be from the age classes 19 and 20 and 32 to 36 years, inclusive.

Valuation Report on the Winston-Salem Southbound

Decision of the Interstate Commerce Commission Follows Previous Findings on the Texas Midland

THE INTERSTATE COMMERCE COMMISSION has issued a report on its decision of August 8, with respect to the valuation of the Winston-Salem Southbound. The general trend of the decision follows very closely that previously given on the Texas Midland, and frequent references are made to the earlier decision. An abstract of the earlier report appeared in the *Railway Age* of August 30, page 377. However, certain matters of controversy not enlarged upon in the earlier report are discussed at some length in the Winston-Salem decision.

The commission found the original cost to date of the property to be \$5,197,452. The cost of reproduction new was placed at \$5,356,836 and the cost of reproduction less depreciation at \$4,966,922. The investment in road and equipment, as stated in the books of the carrier on June 30, 1915, was \$5,598,557.73. By certain adjustments this was reduced to \$5,526,187 for road and equipment, including land, and \$29,357 representing non-carrier land. The cost of reproduction values are shown in greater detail in the following table:

SUMMARY, ENTIRE LINE--87.700 MILES OF MAIN AND 2.298 MILES OF BRANCH LINE

Acct. No.	Classes	I. ROAD	Cost of re- production, new	Cost of re- production, less depreciation
1	Engineering	\$202,534	\$202,534	
3	Grading	1,765,876	1,763,558	
6	Bridges, trestles and culverts	1,013,889	961,809	
8	Ties	189,970	96,916	
9	Rails	521,678	492,481	
10	Other track material	104,586	87,498	
11	Ballast	269,635	235,302	
12	Tracklaying and surfacing	194,384	163,756	
13	Right-of-way fences	768	477	
15	Crossings and signs	153,385	140,649	
16	Station and office buildings	121,168	110,898	
17	Roadway buildings	19,484	17,658	
18	Water stations	37,833	33,848	
19	Fuel stations	12,987	9,278	
26	Telegraph and telephone lines	37,319	31,197	
27	Signals and interlockers	11,284	10,111	
35	Miscellaneous structures	41,670	35,420	
37	Broadway machines	2,716	2,305	
38	Roadway small tools	1,477	837	
48	Other physical property	665	499	
Total, 1 and 3 to 48 inclusive		\$4,703,308	\$4,397,031	
 II. EQUIPMENT				
51	Steam locomotives	87,075	65,283	
53	Freight-train cars	175,365	145,598	
54	Passenger-train cars	14,120	10,583	
57	Work equipment	15,605	11,162	
Total, 51 to 58, inclusive		\$292,165	\$232,626	
 III. GENERAL EXPENDITURES				
76	Interest during construction	\$290,813	\$271,301	
All other general expenditures accounts		70,550	65,964	
Total, 71 to 77, inclusive		\$361,363	\$337,265	
Grand total, 1, and 3 to 77, inclusive		\$5,356,836	\$4,966,922	

As in the earlier report, the large part of the space was devoted to a discussion of the protests of the carrier and others. Portions of the report are abstracted below.

Original Cost to Date

It is claimed by the carrier in its protest that the amount of original cost to date stated is less than should be shown by reason of the failure to include certain items of actual expenditure, e.g.: (1) Road and equipment; preliminary surveys; services of the general officers of the proprietor companies; superintendence; use of work equipment, interest and other costs, furnished and paid by the proprietor companies and not charged on the books of the carrier, and (2) Land: Proportion of salaries and expenses of general officers in connection with the purchase of land, and proportion of salary and expenses of attorney in right of way matters.

It is shown in the accounting report that the carrier presented a claim that the survey in question was made in 1892, some 13 years before the carrier was chartered. Many years have intervened since these claimed costs were incurred; they have never become an account stated. Nor, as far as this record shows, have either of the proprietor companies ever presented a claim against the carrier for any part of the sums stated. We see no reason to set aside the contemporaneous interpretation placed upon the transaction by the parties.

It is protested by the carrier that the tentative valuation excludes any allowance for working capital, and that \$70,000 should be included for this purpose. The accounting report, which is a part of the tentative valuation, shows that on valuation date the carrier had on hand \$58,468.25. The character and amount of the carrier's other current assets also appears in its general balance sheet, which we will carry from the accounting report into the final valuation.

Cost of Reproduction New

The carrier protests the use of quantities as of 1915, in connection with unit prices as in 1914. The prices employed by the bureau of valuation are not the exact prices which were necessarily in effect upon the precise date, June 30, 1914, but were fixed with relation to that date in such a way as to produce normal prices for periods ranging from 5 to 10 years prior thereto.

We can not shut our eyes to the fact that the effect of the breaking out of the European war was to demoralize the markets for labor and material, so that prices current on that precise date, June 30, 1915, or over a period of time which would reflect the effect of a war which has largely monopolized the labor and material market to the exclusion of private industry, can not in any sense be said to represent normal or fair values.

With respect to lands, however, as to which the cost-of-reproduction theory is not applied, the values of which do not fluctuate wildly with war, and as to which present value is

the criterion, a different situation is presented, and we have employed values as of the date of valuation.

Railroad Crossings

It is protested by the carrier that the tentative valuation omits certain items of property owned or used by the carrier. These are detailed as (1) property owned or used, constructed at the carrier's expense, such as overhead crossings with other railroads, 50 per cent of the grade crossings with another carrier, and a certain spur and coal trestle, and (2) property owned or used, but not constructed at carrier's expense, of which the tracks and facilities of other carriers at certain points, equipment of other carriers, private car lines, etc., are specified.

It has been the practice of the bureau of valuation to apportion the estimated costs of reproduction in accordance with any agreement as to ownership of property of this character which the interested carriers may make. Failing such agreement, the cost of reproduction estimates of the junior carrier omit, in the case of under-crossings, anything for the assumed reproduction of structures used entirely for the passage of the trains of the senior companies; but the cost of reproduction estimates of every junior carrier includes the estimated cost of reproducing the property exclusively used by it. One-half of the estimated cost of reproducing property commonly used by both carriers, such as crossing frogs, is carried into the tentative valuation of the southbound company. Such practice has been followed in the tentative report in this case.

The carrier contends that if it be assumed for purposes of determining the cost of reproduction that other railroads exist as of valuation date, then as a matter of theory it must be assumed that the identical structures which the Southbound company as the junior carrier was obliged to construct would likewise have to be constructed in reproduction. The method followed in the tentative valuation does in fact contemplate the assumed existence of the railroads as crossed, and gives full credit in the cost of reproduction estimates for whatever is shown to be owned by a carrier, or occupied and used by it, while showing, as a historical fact for whatever it may be worth, the expenditures in fact made by the carrier in original construction.

Contingencies

The general nature of the contingencies for which claims are made may thus be stated: (1) Amounts paid the contractor for a release of contracts when, after construction had begun, the manner of doing the work was changed; (2) disputed items of yardage not calculated in certain cases; (3) yardage of earth rehandled because an apparently suitable borrow pit, partially utilized, was found to be unsuitable; (4) change in alignment found desirable after work had been started on the location originally fixed; (5) grading commenced, but not completed, for connection with another carrier, upon land owned by the carrier, the project being indefinitely deferred; (6) a trestle which was started for drainage purposes and which the carrier was afterwards permitted to fill. The protest also excepts to the omission to take into consideration as a necessary item in the reproduction program property which in fact was acquired in original construction but was abandoned by reason of proper and reasonable changes of plans due to changed conditions during construction. It is not contended by the carrier that all such items, so far as they relate to the construction of the carrier's property, are not taken into account in the statement of original cost to date.

Obviously it can not be assumed that in theoretical reproduction of the property these contingencies would occur, and no sum should be included in the estimate of cost of reproduction new in the valuation, because of such past occurrences.

Interest During Construction

The carrier protests that the engineering program for reproduction, adopted as the basis for the tentative valuation, is too short. The length of the construction program assumed bears directly upon the amount which is to be included in the reproduction estimates for interest during construction. This railroad has a main line about 88 miles in length, with a branch about 2 miles long. The carrier claims that to reproduce the railroad would require approximately eight years. Construction was in fact completed in about two years. It appears from the record that except for reconnaissance and preliminary surveys, for which nine months was estimated as necessary, the road could be constructed, from the letting of contracts to the putting into operation, within two years. The interest shown in the reproduction estimates in the tentative report was reckoned for one-half of the construction period assumed by the engineers of the commission. Interest was computed on the equipment accounts at the same rate for a period of 3 months.

Subsequent to the service of the tentative valuation, in view of the desirability of a railroad under construction having on hand a certain amount of money upon which to draw for its expenditures during such process, the bureau of valuation recommended that interest during construction should be computed upon the road accounts enumerated and general expenditures at the full rate for half the construction period plus three months. Equipment being usually brought only when the road is practically completed interest was estimated in the tentative valuation for three months, and the recommendation of the bureau did not change this amount.

No interest has been included in the reproduction estimates contained in the tentative report on account of the cost of land. The non-allowance of interest on the present value of land in the reproduction estimate conforms to the holding of the Supreme Court in the Minnesota Rate Cases, 230 U. S., 352, 455.

Development Cost

It is contended by the carrier that in correctly estimating the cost of constructing, completing, and equipping a going railroad there must be added to the cost of construction and assembling an amount to cover the cost of developing the business. Computations were presented which purported to show that after the road was opened to traffic in 1911 until the date of valuation, June 30, 1915, the results of operation had been a deficit of more than \$410,000, which deficit did not include all the interest actually paid. Computations were also presented, representing the total development cost claimed by the carrier, amounting to \$853,591. It is insisted that this figure must be added to the cost of reproduction, in order that the result will reflect the true cost of reproducing the property in the condition existing on valuation date.

The valuation amendment requires us to ascertain the cost of reproduction new, and not the cost of reproduction in any other condition. By the method pursued by the bureau of valuation in ascertaining quantities, such costs in the early years of the enterprise as resulted in permanent increases to the property, are all discovered and taken into account.

It appears from the offer of testimony by the carrier as to development costs that all the data requisite to the computation thereof appear in the accounting report appended to the tentative valuation.

Whether, in fixing a value for purposes under the act to regulate commerce, we should increase the cost of reproduction by the amount of deficit which the carrier may have incurred during the early years of the enterprise, will be a proper consideration when we come to state a single sum as value of the common-carrier property for such purposes. That question we leave intact. As stated, in the final valuation herein made we have the basic facts. The record herein shows no other values or elements of value.

Efficiency in the Handling of Railway Supplies*

PART II. Line Stock, Ordering Material, Surplus and Obsolete Material, and Inventories

By Charles E. Parks

Assistant Editor, The Santa Fe Magazine, Chicago.

Line Stock

THE VALUE of all material on the Santa Fe is carried in the store department accounts until it is actually applied, that is, instead of charging it direct to operating and addition and betterment accounts in large amounts when it leaves the storehouse or is shipped to the work by outside firms, it remains in the store department account until it is actually used and so reported by the foremen doing the work. This situation has given rise to what is known as line stock, so called because the material is distributed at various points along the line for the convenience of the operating department.

Line stock corresponds to the mechanical department working stock and consists of the following material: Steel bridges, lumber, and track material, including frogs, switches, switch stands, guard rails, tie plates, rail anchors, rail joints, bolts and switch ties. While this material is widely separated and not directly under the supervision of the storekeeper, he is as responsible for the condition and accounting of it as though it were in the storehouse. On some divisions this line stock is located at a dozen or more points; on others it is located in two or three material yards, but it is the general policy to have it located near section toolhouses and in material yards. These material yards correspond with the mechanical department's substores.

The difficulties connected with line stock are largely of an accounting nature. They include the inability to make a proper inspection due to the inaccessibility of the material and the time which must be consumed in checking it. This is usually done by the storekeeper on a local train, the supply train or on a motor car. Other difficulties met with are the failure of track and bridge and building foremen to report the material used; the delay in receiving requisitions, resulting in a failure to include in the current month's accounts; and the failure of those interested to keep the material properly piled and free from surplus and worn out articles.

The first difficulty has been met by concentrating the main items at central points, leaving only the tie plates, and necessary bolts and spikes at section headquarters. These are sorted, piled, marked and located near the section toolhouse. This permits the storekeeper to check the main items monthly and a complete check of each section is made conveniently at each inventory period. The second difficulty is met by educating section foremen on the importance of rendering accurate reports. The division superintendent's approval is final and the requisitions are now forwarded to the storekeepers on time.

Accounting for Line Stock

Line stock was established with a view of determining when and where the class of material covered may have been used—whether in main or yard tracks and what weight and kind of material was released. This information is required for three principal reasons:

- (1) To determine the increased weight or cost of track material applied over that released as a basis for the charge to additions and betterments.
- (2) To separate the cost of track material applied to yard

*The first article was published in the issue of September 6, 1918, page 423.

tracks from main and passing tracks so as to comply with the requirements of the Interstate Commerce Commission in respect to dividing operating expenses between freight and passenger.

(3) To obviate the objection of charging the value of material to the accounts at the time it is issued from stock, when in reality it may be on hand unapplied at the end of the current month or even the current year.

It had been the general practice of the Santa Fe to charge out the value of this material when issued from stock, with the results that operating accounts for the current month or year were charged with the value of material still on hand unapplied at the close of the month or year. It is the custom of many other railroads to charge material to superintendents' or master mechanics' suspense accounts to be distributed by them. While this plan has the advantage of including the charge in the accounts for the month in which the material is used, it has the disadvantage of taking the material out from under the custody and supervision of the storekeeper. The stock books under this arrangement do not reflect all unapplied material on hand, do not permit of diverting the surplus material, and, as a rule, require large inventory adjustments.

In order to overcome the objections from the accounting standpoint of charging out the material when it was issued from stock of this class of material, the "line stock" account was authorized. It is not intended that the reserve stock of track material held at storehouses be carried in this account, but only that held for immediate use located in material yards, tool houses and other places along the line. Spikes are not carried in this account except for large addition and betterment jobs, nor broken kegs of bolts on hand at section toolhouses, but all other track material mentioned is carried in the account.

Section and bridge and building foremen's timebooks reflect the material used and requisitions are made from the information contained therein. They are then sent to the division storekeepers after being approved by the superintendent. Division storekeepers keep a stock record of all material carried in line stock on their territories. This record is based on an inventory and shows the location of the material, the quantity, the receipt, issues and balance on hand. As the monthly requisitions are received, the requisition numbers are recorded as well as the material issues. In this way a complete record of the material carried in the line stock is had.

Inventory of line stock is taken three times a year. Division storekeepers handle the adjustment by securing requisitions covering any shortages and submitting forms showing material returned to stock for any serviceable material released, or, in the event of new material, seeing that shippers' invoices are passed in the current inventory month and that invoices are received covering any transfers between divisions.

Tie plates are charged out by the general stores, a tie plate statement covering all tie plates inserted during the month, received, transferred and on hand, being submitted monthly to the general line storekeeper, together with requisitions covering all tie plates inserted during the month.

Ordering Material

Accurate methods of ordering material have a very appreciable effect on the net operating income of a railroad and result in the economical use of supplies, the lessening of waste and the consequent reduction in operating cost. The failure of a store department to supply the necessary material when it is needed is the cause of untold amounts of concealed loss annually and one of the principal contributing factors to this delay is faulty methods of ordering. Accuracy in delivery is perhaps the principal element of successful store-keeping and this is directly dependent upon accuracy in ordering.

Requisitions. The connecting link between the store department and all other departments of a railroad is the requisition. On the Santa Fe there are only three forms of requisition, as follows:

Form 1071: This is originated by the mechanical department for material required for shop and roundhouse use.

Form 1109: Largely used by the operating department for material required in maintenance of way and structures, addition and betterment and construction work, and by the mechanical department for all tools required.

Form 1110: A store department form for use by division storekeepers in ordering material from the general store, and by the general line stores in ordering from the system stores.

A correctly written requisition is the first step to a prompt and accurate delivery and one of the gravest problems of a railway store department is to secure from the maker of requisitions accurate specifications, correct blue prints and pattern members and proper catalogue reference. This information is necessary whether the material is supplied from stock or whether it is purchased.

In order to insure complete information being shown on requisitions submitted to the store department the only method which the Santa Fe has been able to develop is to conduct intermittent campaigns of education with this end in view. This has been done by letter, by personal instructions, bulletins, meetings and publicity of the question in the employees' magazine. While the results produced have not approached the millennium in requisition making, nevertheless a great improvement has been made in the character of the requisitions submitted.

Errors due to incorrect blueprint references are a great source of trouble in delivering material. It is necessary for the store department to recheck all requisitions, not only to insure correct pattern numbers, but also blueprint references. In order to do this properly all general stores are equipped with a blueprint room containing a complete set of locomotive, car, bridge and building, and track drawings, also shop cards, indexed and filed in the order of subject matter. This facility enables the general stores to expedite the checking of requisitions received from local stores that are not provided with drawings, as well as enabling them to check the finished material when received.

Substituting Material. When requisitions lacking proper catalogue reference for material to be ordered are returned to the originator, such actions result in delay to the material and additional expense in handling. The Santa Fe store department does not make a practice of substituting material without first obtaining the consent of the originator of the requisition, it being a policy of the department to meet all demands as to kind, character and quality of material wanted. This has been found to be the best and most economical practice, giving satisfaction to the user of the material and at the same time permitting the store department to work off a surplus and thus preventing it from becoming scrap. By substituting material where practicable, the Santa Fe has materially lessened the value of the material that had been bought and paid for but which it would ordinarily have to throw into the scrap pile.

Surplus and Obsolete Material

A railroad store department is equally as interested in preventing a collection of surplus and obsolete material as it is in preventing a shortage. Surplus is merely a synonym for extravagance and obsolete for waste. The value of this class of material is only a part of the unnecessary expense connected with it, as it must be handled, stored, hauled, insured and taxed, all of which are additional charges.

The problem of preventing and disposing of this material has been thoroughly investigated on the Santa Fe and on foreign lines with the result that the store department is now handling it in a very satisfactory manner. The accumulation of surplus and obsolete articles in storehouses is due to several conditions, among which are the transferring of power, changes in standards, the lack of co-operation received from the other department heads, and the failure of local storekeepers to keep in touch with their stock books and surplus reports.

Surplus due to transferring power from one division to another has been remedied by receiving advice of such transfers from the mechanical department, so that the material now used to protect certain classes of power on one division is transferred when the power is transferred. Changes in standards brought about by weakness of material, retrenchment, legislation or other causes have been a prolific cause of surplus and obsolete material. This condition has been largely remedied by notice in changes in standards being submitted to the store department by department heads interested at the time the changes are first contemplated. The storekeeper then prepares a list of the material which will become obsolete and submits it to the other department interested. The latter then decides whether to use the old stock, remake it or scrap it. If it is decided to use the old material before introducing the new, the requisitions are closely watched and delivery of the new material refused as long as any of the old material is available. In order to insure this being done, report is made to the general storekeeper covering the articles on hand that have been made obsolete. In many cases the major portion of the stock is transferred to the general store as soon as information of the change of standards has been received.

When it is decided to apply the new standards as soon as the material is obtainable, the store department generally has no discretion as to the handling, except to ascertain whether or not the old material can be converted to other uses.

Disposing of surplus and obsolete material is not difficult. Storekeepers report monthly to the general storekeeper all surplus and obsolete material on hand. The latter is then in position to transfer the surplus where a shortage exists on another division, or he may apply it on requisitions. If no disposition can be made of a local surplus, if standard material, it is concentrated at the general store of each system line and special items concentrated at the general system store in Topeka. This permits of it being closely watched and checked with all purchasing agents' orders and often the material can be substituted for something that had been ordered purchased. The saving effected on only a few items thus substituted will more than pay the transportation charges of the surplus material. Some obsolete material is scrapped, especially locomotive and car castings and brass. Some of it is re-worked when the cost of re-working does not exceed the cost of a new article. When no disposition can be given of obsolete material it is reported as being on hand continually, until it eventually finds its way to the reclamation plant.

By these means most gratifying results have been attained in reducing the amount of surplus and obsolete material on hand. The stock on the Santa Fe is clean and used, rather than simply inventoried from year to year.

Material Returned to Stock

A vast saving is effected on the Santa Fe each year through the practice of returning to stock all new and second-hand material unapplied and not required for immediate use, and by a systematic accounting for this class of material. This saving is represented by the difference between the cost of the new or second-hand material and its scrap value. A careful check is made by the store department of all material offered for credit to prevent an accumulation of obsolete stock and the burdening of the store accounts with worthless material. For this reason no obsolete material or material requiring too expensive repairs is accepted for credit but is scrapped. In case of controversies over the value of material offered, a joint inspection is made by the storekeeper, master mechanic, superintendent or the superintendent of shops, but the store department reserves the right of final decisions as its accounts must bear the burden of the article.

Accounting for material returned to stock differs from accounting for directly purchased articles in that payment is made in the form of a credit entry in the account to which the value of the article had been previously charged instead of a payment in money. All material returned to stock must be accompanied by a transmittal notice properly made out. This notice is used by the store department as an invoice and is given the same care and attention as is given a manufacturer's invoice. It performs the same functions as an invoice, as the stock it represents stands as an asset to the store department the same as new material bought from manufacturers. This form is required to be made as complete as a requisition, showing a list of the material offered for credit, the pattern number, size, quantity, and catalogue reference, and also the date, division, account or engine to receive credit. If the material is accepted by the storekeeper the form is priced and a copy of it returned to the head of the department in which it originated to be included in his monthly credit bill. If the material is not accepted the form is returned with a proper notation. At the end of the month all these forms are charged to the store stock account.

The practice of returning serviceable material to stock has so improved under correct management that, whereas a few years ago 60 per cent of the material received at the reclamation plant was serviceable, now only about 6 per cent can be so classified.

Inventories

Inventory of all material carried in stock on the Santa Fe, with the exception of line stock and mechanical department working stock, is taken annually. These latter stocks are taken three times a year. Inventory of miscellaneous material and supplies, including material in storehouses, storage platforms and material yards, material in process of manufacture on shop orders, stationery, ice and fuel is taken by actual count, measurement or weight of every item carried in stock and recorded on printed inventory sheets in triplicate. Printed inventory sheets offer the same advantages as printed stock books, as they are arranged according to the standard classification and in the order in which the stock is stored. They contain a description of the article, the unit of measure, price, quantity, weight and amount.

The prices used on inventories must be supported by entries in the standard price book which are based on the latest invoices, and must show clearly whether based in price per pound, hundred-weight, dozen, etc. All pricing, extensions and footings are made by the store taking the inventory, except on special inventories when the pricing and extension are done by the general store. A recapitulation of inventories is made by sections, followed by a grand recapitulation of the sections. Adjustment sheets showing material paid

for prior to inventory but not received until later, material issued from stock prior to inventory but not charged out, and material received prior to inventory but not paid for must accompany the inventory sheets.

The inventory of rail and new cross ties is taken by section foremen under the supervision of the division superintendent. All rail, whether new, second-hand or scrap, is inventoried by length and sectional weight, the number of pieces of each length of each sectional weight being shown. New cross ties are inventoried under four or five classifications based on the kinds of wood. After the inventory has been taken by section foremen and recorded by them on special blanks provided for this purpose it is checked by division storekeepers, roadmasters, and division accountants. That is, the inventory books are collected personally by these officials and the entries verified by actual count on each section. Any discrepancies found are adjusted on the spot. The books are then forwarded to the superintendent, where they are footed and extended, a recapitulation by sections, districts and a general recapitulation of the rail and ties on the division made. An inventory of line stock is taken at the same time as the inventory of rail and ties and is checked and recapitulated in the same manner.

All inventories are forwarded to the line or general storekeeper, who checks all footings and extensions, investigates all discrepancies between the inventories and book balances, makes general recapitulations and certifies as to their correctness. The inventories are then forwarded to the auditor of disbursements and all adjustments of stock books is made on the inventory basis.

Modification of Contingent Fee Warranty Expected

THE RAILWAY BUSINESS ASSOCIATION, through its secretary, Frank W. Noxon, has sent to its members a letter entitled, "Railroad Administration Will Ask for Modification of Contingent Fee Warranty." The letter follows:

"H. B. Spencer, chairman of the Central Advisory Purchasing Committee, authorizes me to say that the Railroad Administration has decided to urge upon the Department of Justice a modification of the warranty against contingent fees which would enable the railroads to deal with regularly accredited commission agents.

"The law department of the Railroad Administration is preparing a proposal designed to meet the complexity and decentralization that distinguish conditions in railroad buying from those affecting commodities already exempted from the warranty—namely, textiles for the army quartermaster and coal for various departments. Probably the plan to be submitted will provide for a certificate from the manufacturer that the commission agent is his bona fide representative.

"The attorney general has maintained the position that he could consider requests for modification only when the petitioner was the government department involved. It was upon the motion of the War Department and of the Fuel Administration respectively that the modifications already made were sanctioned."

THE CEUTA-TETUAN RAILWAY was officially opened in the third week of May. The line is narrow gage and has a total length of 25 miles between Ceuta, Morocco, and Tetuan, mostly over a level plain; five tunnels of a total length of nearly half a mile, and five small bridges had to be constructed.

Traveling Engineers' Association Convention

A Most Successful Meeting—Patriotism, Service and Action the Keynote—Over 1,400 in Attendance

THE TRAVELING ENGINEERS' ASSOCIATION opened its twenty-sixth convention on September 10, at the Olympic Theatre, Chicago, with President B. J. Feeny presiding. After an invocation by Bishop Fallows, the president delivered his address.

Address of President Feeny

The government of the United States has taken control of the railroads and has placed the Hon. W. G. McAdoo in charge of them as director general of the United States Railroad Administration. This association stands absolutely loyal to him first, last and at all times.

It has been decided by the Railroad Administration that it is to the best interests of the railroad world that the Traveling Engineers hold their convention this year on account of the greatly changed conditions brought about under government operation and this will be a win-the-war convention. We are all in the service of the government and we must render our service to the greatest extent. This association through its Council of National Defense Committee pledged itself to the fullest co-operation and support, and each and every one of us must do all in our power to obtain the maximum efficiency from men, material and supplies. It, therefore, becomes the sacred duty of every true and loyal American to concentrate his thoughts, his energy and his very life, if necessary, to the supreme task of winning this war. If we fail to win this war the liberty so dear to the hearts of the American people will be a thing of the past.

In entering this war we have taken upon ourselves a great responsibility, and one which will command the labor and service of every citizen. We must contribute the men and material necessary to reach a turning point and to keep that point behind us forever. Our heroic boys over there (among whom are many members of this association) are giving their thoughts, their capacity for endurance and their lives for you and their country, and it is gratifying to note that beneath the Flag of Freedom they are as brave men as ever faced a foe. They are looking for us to support them in every way possible as their success on European battlefields depends on the backing they receive from the patriotic and loyal citizens of these United States. You and I cannot sit still with folded hands and see someone else make the supreme sacrifice in our behalf. We are in the war and we must win the war!

This association is one of the vitally important factors in

winning the war, for without good transportation our men, money and munitions would be useless. Man power and motive power will win the war. They are today the two greatest necessities, and any preventable waste in this world's crisis is inexcusable and indefensible. Upon members of this association rests a great responsibility in conserving men and material, and for the part you are playing in this war you are not alone answering to yourself and your government, but you are answering to the boys over there who are winning the war. Conservation is of prime importance—conservation of every kind. Conservation of fuel is of vital importance. This one factor means more to our country than any other one thing. With the expansion of our war industries, the increased demand for fuel for our navy, shipping board and railroads, the most drastic fuel economy must be enforced if this country is to escape a most serious fuel shortage next winter.

Greater efficiency must be obtained than ever before and this must be done by education and co-operation. It is possible to get better results from nearly all railroads with practically no additional expense, if every one will profit by his experience and put the knowledge so gained into effect. We should analyze what can be done under present conditions on the railroads which we serve and then make such recommendations as will be justified under win-the-war conditions.

Our government wants conservation—willing conservation if possible. It will enforce conservation if necessary, and from now on let every man of this association who loves America and liberty say "I will conserve. I will put my best efforts forth every day in order that my country will win this war."

In reviewing the requirements and duties of traveling engineers on the various roads, I find that there is a lack of uniformity as to just what is required of them. Standardization of the duties of traveling engineers is necessary to render efficient service. Familiarity of its detail is essential on account of the large number of inexperienced men that are being placed on the locomotives due to the great number of experienced men who have responded to the call of our country to take up arms, and I earnestly recommend to you—

First—To apply yourselves entirely to the management and operation of locomotives.

Second—To co-operate with the various operating departments.



B. J. Feeny
President, Traveling Engineers' Association

Third—By making suggestions for the improving of conditions which come to your attention in the performance of your locomotive duties.

The Railway Supplymen's Association has arranged for our benefit a splendid exhibit of interesting locomotive supplies and their representatives are here to explain the merits of their material and devices. Much credit is due to the supplymen for their educational work, for we have learned from them the most successful way to apply and operate the material and devices which increase the efficiency of the locomotive. All members should spend as much time around, and give as much attention as possible to, the exhibits. It is far more necessary than ever before on account of the distribution of government standard locomotives.

On the twenty-eighth day of this month every man in the United States will be facing a financial obligation. A little forethought now, a little economy, a little inconvenience, will enable you to meet this obligation and it will give you a warm feeling in your heart when you have fulfilled it. The obligation I refer to is the Fourth Liberty Loan.

I recommend that our secretary be authorized to send a telegram to the President of the United States, Hon. Woodrow Wilson, and to the Hon. W. G. McAdoo, director general, United States Railroad Administration, informing them we are in convention to help win the war and reaffirm our pledge of full support.

Address by Frank McManamy

There has never been a time in the history of American railroads when the motto of the Traveling Engineer's Association, which is, "To improve the locomotive service on American Railroads," meant as much as it does today. And there is no man in railroad service who can do more to improve the locomotive service on American railroads than the traveling engineer, if he is given proper support. The convention of the Traveling Engineer's Association was therefore authorized by the Railroad Administration because of the value men who are on the firing line of railroad operation obtain from a convention of this kind, where they can interchange ideas and discuss problems and difficulties which all of us must meet and overcome if the national railroad system is to be successfully operated.

Under government operation the work and the difficulties of the traveling engineer have been greatly increased. He is apt to be called upon to look after every known type of locomotive and is expected to obtain equally good results out of all of them.

When I issued instructions to increase shop hours to 70 per week, which roughly speaking meant an increase of 20 per cent in shop efficiency and shop output the response of the railroad employees was extremely gratifying and we have yet to find the first instance where after knowing that it was the desire of the government that the shop hours be increased, that the men refused or failed to work the desired number of hours. The same is true of the men in road service, and men in hundreds of instances gave up their rest period to prevent locomotives, which could not be properly housed, from freezing up and thereby being disabled. The increase in hours in railroad shops has enabled us to increase the number of locomotives repaired about 500 each week over the corresponding week last year and to decrease the percentage of locomotives which are out of service for repairs requiring more than 24 hours from over 18 per cent to a fraction above 14 per cent.

Everyone knows the difficulty of building up the condition of motive power during a period of heavy business, and particularly when there is a shortage of skilled labor at the same time; but this has been accomplished by the govern-

ment during the most trying period in the history of the American railroads.

When the director general assumed control of the railways it became possible for the first time in the history of the country to adopt and enforce standards. The necessity, during the past winter of transferring locomotives from one line to another and the difficulty experienced in making repairs to such locomotives, when away from their home lines, emphasized the importance of standardizing locomotive construction and this was at once started through the medium of a committee composed of well known mechanical department officials from different sections of the country. As a result of the work of this committee 12 standard specifications for locomotives were agreed upon and 1514 United States standard locomotives have already been ordered and the locomotives are now being constructed at the rate of about 50 per week.

That the standardization of locomotives will facilitate not only the repairs to locomotives and the building of new ones has already been demonstrated, because when standard drawings and patterns have been made it eliminates further delay either in the drafting room or in the pattern shop and enables larger quantities of material to be ordered. Mechanics also work to better advantage on locomotives of the same general type and dimensions.

President Wilson, on April 15, 1917, said:

"To the men who run the railways of the country, whether they be managers or operative employees, let me say that the railways are the arteries of the nation's life, and that upon them rests the immense responsibility of seeing to it that these arteries suffer no obstruction of any kind, no inefficiency or slackened power."

The traveling engineer comes more closely in contact with the men who operate the locomotives of the country than any other railroad official and can do more to prevent the "Inefficiency and slackened power," referred to by President Wilson than any other railroad official.

While the duties of the traveling engineer can be subdivided into a multitude of different items they can be broadly covered under two heads. First, to see that the motive power is kept in good condition for service. Second, to see that it is efficiently and economically operated. Do not understand from this that the traveling engineer is supposed to look after the operation of shops and roundhouses because that is a different line of work, but he should see that all defects which develop in service which prevent economical and efficient performance, should be properly reported and he should insist that repairs be made before the locomotive is returned to service; to carry this out successfully his orders to hold a locomotive for repairs should be observed the same as the orders of federal inspectors. Locomotives should not be offered for service unless they are in a condition to make a successful trip and the traveling engineer should, as far as possible, see that they are not permitted to go into service unless in good condition. The traveling engineer should know the condition of every locomotive under his charge and should see to it that they are shopped for repairs before their condition becomes such that they might reasonably be expected to cause failure on the road. Instructing enginemen as to the proper and efficient performance of their work is not the least of his duties, and the man who is most successful in having the locomotives properly maintained will obtain the greatest degree of co-operation from the enginemen under him and without this his road will be exceedingly rough.

The economic use of fuel is one of the things that is usually under the direction of the traveling engineer and to bring this about he must have the co-operation of the shopmen, the engineers and the firemen. Instructing enginemen as to the proper use of the air brake, operation of the locomotive,

transportation rules and proper methods of firing are some of the things which he must look after in addition to the general condition of the locomotives while he is on the road. This no doubt sounds like a pretty big contract, and so it is, but it is only an outline of what is being successfully done by the various traveling engineers.

It is particularly important at this time that every railroad man should do all in his power to promote efficiency in locomotive operation. Winter is but a few months away and we should bear in mind the experiences of last winter and make every effort to go into the coming winter with everything in the best shape it is possible to get it.

It requires about four tons of shipping to maintain one American soldier in France. We have already more than a million and a half of our boys "over there" and it is proposed to put as many more millions there as may be necessary to carry the war to a successful conclusion. It is up to the railroads not only to supply cargoes for this four tons of shipping for each soldier, but to transport the material for building the ships. During the coming winter every railroad man must prepare to do a little more and do it a little better than he has ever done before.

Order No. 8, issued by the director general of railroads, February 21, 1918, reads in part:

"The government now being in control of the railroads, the officers and employees of the various companies no longer serve a private interest. All now serve the government and the public interest only. I want the officers and employees to get the spirit of the new era."

No more important principle has been advanced in connection with the government operation of railroads.

The government did not wish to assume, in addition to the other burdens imposed upon it, the task of reorganizing and operating the American railroads. There was no particular desire on the part of the government or any substantial portion of the American people to go into the railroad business at that time. The railroads were placed under federal control because in the crisis brought about by the war they had practically ceased to function under private management.

I shall not attempt to explain the reasons for this condition because they are many, and the important ones are well known. It is sufficient to state that in a national crisis, when unusual and excessive burdens were placed upon the railroads, when it became essential that the railroads should operate at their highest efficiency as a national unit, the many weak points in the plan of operating the railroads under private management, in numerous systems or units had caused such congestions in various centers of industry that the collapse of the entire transportation system became imminent, at a time when such a collapse would be a world wide calamity. No organization with less authority and power than the federal government could control and direct such a huge task as the nationalization of the American railroads.

During the period immediately preceding the taking over of the railroads by the government we have all heard many railroad men express in a somewhat sarcastic spirit the wish that the government would attempt to operate the railroads, just to see what kind of a mess they would make of it. Such expressions were doubtless made without having given careful consideration to the fact that Uncle Sam has a score of 100 on everything that he has ever undertaken. The United States makes no failures. The question is no longer, can the government successfully operate the railroads, because that has already been demonstrated, the only question now is, how big a success is it going to be? That question will be largely determined by the spirit in which the principles laid down by the President and the director general are carried out and no body of men can do more to aid in carrying out those principles than the members of the Traveling Engineer's Association.

Again quoting from Order No. 8 issued by the director general of railroads:

"Supreme devotion to country, an invincible determination to perform the imperative duties of the hour while the life of the nation is imperiled by war, must obliterate old enmities and make friends and comrades of us all. There must be co-operation, not antagonism; confidence, not suspicion; mutual helpfulness, not grudging performance; just consideration, not arbitrary disregard of each other's rights and feelings; a fine discipline, based on mutual respect and sympathy; and an earnest desire to serve the great public faithfully and efficiently. This is the spirit and purpose that must pervade every part and branch of the national railroad service."

The importance and the greatness of the service which the American railroad men are called upon to render is, I fear, not fully realized. Everyone knows that we are in this war to win and that we are going to win and the splendid reports of the work of our boys in France leaves no doubt in any one's mind as to what they are doing and what they are going to do: but the thing that railroad men here must realize is that they are an essential part of the American Expeditionary Force. That they are truly a part of the American army. That they have an important link in the chain of communications with the front to maintain and to operate successfully and that a failure of any part of our transportation system is the only thing that can possibly endanger the success of the Allied army. But such a failure will not occur if we who are operating the railroads do our bit as well as the boys who have gone across. Just as sure as Washington crossed the Delaware, Pershing with a million of our boys behind him will cross the Rhine.

Mr. McManamy spoke extemporaneously of the operating features of the government standard locomotives, which he characterized as among the best ever designed. He said there was nothing freakish about them and for that reason it should be easy for the enginemen to become accustomed to them. He anticipated that they would eliminate the troubles encountered in maintaining equipment borrowed from other lines. This foreign power, Mr. McManamy stated, was often held up for periods as long as 30 days, due to delays in securing material with which to make repairs.

Remarks by Mr. MacBain

D. R. MacBain offered some suggestions for increasing the service secured from motive power. He dwelt particularly on the importance of the traveling engineers devoting all their time to improving the condition of locomotives and instructing enginemen in the proper methods of handling them. At the present time they are often required to devote a large share of their time to the investigation of minor matters of discipline to the exclusion of more important work.

Mr. Quayle's Address

Robert Quayle, superintendent motive power and car department of the Chicago & North Western, spoke of the importance of the work of the traveling engineer and the necessity of having men who could handle it in a broad, thorough manner. The traveling engineer, if he is the right kind of a man, must be able to get others to respond to his efforts. To do this he should work with the idea of serving rather than dominating.

Touching on the problem of fuel conservation, Mr. Quayle said that the production of coal was not keeping pace with the demand. There is danger of a shortage which will slow up our manufactures. Every man must be thinking and working to conserve the fuel supply. Coal must be utilized to get the maximum result. To do that the locomotives must be kept in the best of condition. The traveling engineers should see that all necessary repairs are made before the locomotive leaves the roundhouse.

How Can the Traveling Engineers Best Aid in the Maintenance of Locomotives

By F. P. Roesch

Fuel Supervisor, Northwestern Region, U. S. Railroad Administration.

There is no question but what the demand for power will be equally as great if not greater this winter than it was last, and to meet this demand it is imperative that all lend their best and united efforts to put and keep the power in the best possible condition.

Those whose duty it is to overhaul and maintain power are up against a hard proposition. Skilled shopmen are scarce and hard to get. The railway shops have been depleted by draft, enlistments and by mechanics entering other fields holding out the promise of a higher remuneration; therefore the time of every shopman is worth much more to the Railroad Administration than is represented in mere dollars and cents. Every hour spent in doing unnecessary work, every hour spent in repairing an avoidable defect or breakdown, is just that much of a setback to another locomotive waiting to be turned out of the shop or roundhouse.

Here is where the traveling engineer can help in maintaining power. The first requirement will be unqualified and undivided loyalty to the United States Railroad Administration. Get the full meaning of this statement. Beyond doubt, during the coming winter it will be necessary to transfer power from one road to another as the demands of the traffic require. If a traveling engineer thinks and acts for his home road only, is it not natural that when he sees a locomotive lettered P. D. Q. Railway or even U. S. A., he will say: "That is not one of our engines, so I won't bother my head with it"? And does it not follow that his attitude will be reflected in the work of the enginemen? It may extend even to the roundhouse men as far as the wipers.

Forget the X. Y. Z. Railroad and remember only the U. S. A., because one engine is just as valuable to the Railroad Administration as another engine, and all should receive exactly the same amount of care and attention on your part and that of the men under your supervision as the engines bought for and owned outright by the company directly employing you.

Remember that in order to correct a defect it must first be known. Terminal inspectors are invaluable and find many defects, but the real place to inspect a locomotive is on the road and in service. Suppose, for instance, a follower bolt was working out of a piston head, could any terminal inspection locate it? Are there not many other defects that only manifest themselves when the engine is running that no terminal inspection, no matter how thorough, can locate?

It is a short job to replace a follower bolt, but it takes time to patch a cylinder. If shopmen don't have to spend so much time repairing avoidable breakdowns they will have more time to make repairs due to normal wear and tear.

Is it not clear that you can materially assist in maintaining power by carefully noting each defect in every engine you ride and in reporting it immediately, before it results in a breakdown?

There are at present 50 federal inspectors to cover 250,000 miles of railroad. When we look back and see what these 50 men have accomplished toward improving the general condition of all the locomotives in the United States, we can appreciate what 1,300 traveling engineers working along the same lines can do.

After you have convinced yourself that you are working for the U. S. A. and not the X. Y. Z. Railroad, line up the men under your supervision in the same way. Show your men that all locomotives are U. S. A. locomotives, and that

it is their duty to get the very best there is in them out of them; that when laying on sidings waiting for other trains, they should, if they would deserve the name of enginemen in every sense of the word, get down and inspect their engines, tighten up any loose nut or bolt they may find, put a nail or piece of wire in place of any missing cotter or split key, fill a grease cup or set up a wedge, if necessary, or do anything else that they can do to help matters along, regardless of any contracts or agreements they may have relieving them of this duty. And have them make notes of any defects they cannot repair, and report them on arrival, even though they are not required to make work or inspection reports.

Think how much of the time of shopmen they can save by a little timely attention to such small details, and how at one stroke they can increase the number of federal inspectors from 50 to 65,000. The enginemen are now giving us much in faithful and efficient service, but if the matter is put before them in the right light they will give even more. There are no slackers among them.

You can help by being optimistic. Next winter when things are coming tough, kicking or whining will not help matters. Therefore, radiate cheerfulness, smile and make the others smile too. Encourage the enginemen; when they make a good run or save a breakdown, tell them about it. If they are doing wrong, show them the right way, not in a fault-finding manner, but as Robert Quayle put it, "in a big brotherly way," so that the men will see you are trying to help them to help the cause.

But go farther yet with your encouragement. A kind word to an engine watchman or hostler helper may save a bursted branch pipe next winter. Above all things preach the doctrine of U. S. A., not only among road men, but roundhouse men also. You have no authority over roundhouse or shopmen, but do not hang back on that account. Visit the roundhouse, anyway, and cheer up the roundhouse foreman occasionally. He needs it and deserves it. If he has taken the slam or the blow out of an engine, following one of your reports, tell him about it. If a machinist has filed a brass or a truck man has packed a box and has done a good job, tell him. Let them know their work is noticed and appreciated. There is nothing that sets work back as much as all blame and no praise.

If the traveling engineer will work along these lines, put his whole soul and energy into his work, and encourage all others to do likewise, he can do as much toward aiding the United States Railroad Administration toward maintaining locomotives as a whole army of mechanics. Remember always that the man who does not at this time give all that is in him is as much of a slacker as the man who turns his back on the Hun in the trenches.

DISCUSSION

H. M. Curry (Nor. Pac.) spoke of the need of an esprit de corps among the enginemen in the present emergency, and stated that in his opinion nothing would be of more assistance in keeping locomotives in good condition and saving fuel than thorough wiping at terminals. Keeping the engines clean would not only facilitate inspection but would also make the working conditions more pleasant for the enginemen and incite them to greater efforts to keep the power in good condition.

J. B. Hurley (Wabash) spoke of the waste of fuel which often results from the improper use of the injector. He stated that in his opinion the injector should always be operated by the engineer.

One of the members spoke of the desirability of avoiding the unnecessary shifting of power due to the trouble experienced in operating classes of engines with which the men are not familiar. He cited the instance of a class of locomotives which gave so much trouble due to loose follower

bolts that it was found advisable to remove the cylinder heads and inspect the pistons at the end of every round trip.

H. C. Woodbridge, fuel supervisor, Railroad Administration, called attention to the fact that it would barely be possible to get all the locomotives in good condition under the present circumstances. It is therefore essential that the roads face the conditions as they exist and make plans to utilize the motive power to the best advantage.

Several members spoke of the hearty co-operation received from the enginemen. The lodge halls of the brotherhoods had been used by the traveling engineers for meetings with the men. Appeals for economy in the use of fuel had met with a hearty response.

J. C. Petty, (N. C. & St. L.) urged that the more experienced engineers should take upon themselves the duties of the traveling engineers and by making close inspection of their engines and complete work reports enable the traveling engineer to devote his time to instructing new men.

Mr. Hurley called attention to the necessity of properly maintaining the wedges and binders. Well maintained wedges saves the driving boxes and properly maintained binders will reduce the number of broken frames. The traveling engineers should do all they can towards keeping the locomotives in good condition.

Mr. Roesch in closing the discussion said that the traveling engineer belongs in the cab instructing the engine crew. He should see that it does what it can to properly care for the engine. The traveling engineer should work to his utmost covering as many locomotives as he can and to the best of his ability see that they are in proper condition for the engine crew to run. Time and material are of the greatest value to the nation at the present time. He spoke of the possibility of a general pooling of power, particularly if conditions arise similar to those of last winter. The men must be made ready for such an emergency. Pooled power has been operated successfully on some roads and there is no reason why it could not be as successfully operated on all roads. Locomotives transferred from one road to another may give trouble at first but if they are taken in hand promptly these troubles can soon be overcome. They must be overcome and the engines properly maintained for the sake of the nation which is now the paymaster for all railway men. It will cause inconvenience but the war creates inconvenient conditions.

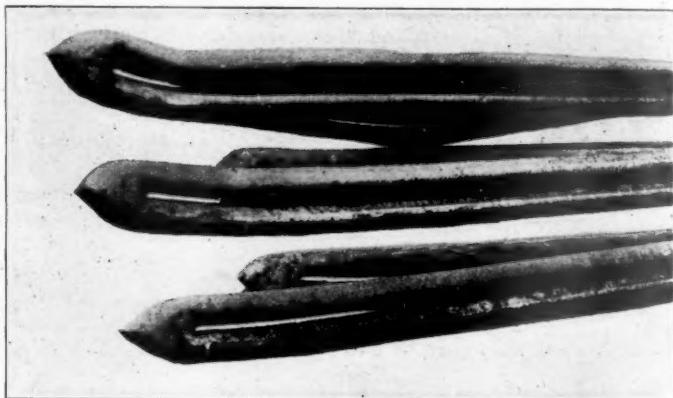
Superheater Locomotive Performance

Superheating as adapted to locomotive service established itself as practical, simple and economical several years ago. So much evidence has been presented from time to time, showing the benefits derived from superheating, that the case is well proven, and further substantiation here is out of place. Our problem is one of maintenance and operation, one of getting full measure of return out of the 25,000 superheater locomotives in service in the United States. They are capable of returning or saving 20 per cent to 25 per cent in coal per unit of work done; they are capable of doing 25 per cent to 30 per cent more work per locomotive than similar saturated steam locomotives, either by hauling heavier trains at given schedules, or given trains at faster schedules. These are positive and direct returns that have been established under day by day operating conditions and are to be expected at all times.

Now, more than any time in the past, is it imperative that locomotives should be kept in a condition to sustain 100 per cent operating load. Every hour of high-priced labor must be made to produce the most, and not wasted in working out some uncertain guess. In the same way every pound of expensive material must be made to earn its high cost; that is, locomotives should leave the freight yard fully loaded to a

rating of higher authority than that provided by the ability of a poor fireman. The emergency of the times demands that full measure be returned from every unit employed. Incompetence and carelessness have no place in the present emergency. Locomotives must be operated and maintained by those who *know* and who *will*. The full measure of the superheater locomotive is 100 per cent of its rating at all times on a minimum consumption of coal and water.

To illustrate more clearly what is meant, the committee takes the liberty of abstracting a recent paper by C. M. Darden, read before the Southern & Southwestern Railway Club. Tests of a Mikado type locomotive developed that a change of $\frac{3}{8}$ -in. in the diameter of the exhaust tip increased the firebox temperature about 400 deg. by increasing the draft, thereby providing more complete combustion, with a resultant saving of \$57,000 in coal per year. The locomotive seemed to be performing satisfactorily before the change, with no complaint from the crew. Adjustment in the valve gear showed an increase of 7.8 per cent in draw-bar horsepower; thus permitting this locomotive to haul the same tonnage at a



Distorted Ends of Superheater Units, One Result of Stopped-Up Flues

higher sustained rate of speed or a proportionate increase in tonnage rating at the same rate of speed. There are several engines of this type in the same class, which multiplies the benefit to the railroad.

Similar investigation of a ten-wheel locomotive which had been converted by the application of a superheater, indicated changes which, when carried out, improved the coal economy 9.8 per cent and also resulted in making up 34 min. on a schedule previously involving delays of over 50 min. The engine is now hauling three additional cars and burning less coal.

Just as any machine requires care and attention to keep its production at a maximum, there are certain fundamentals in maintenance and operation which are essential to the 100 per cent performance of the superheater locomotive. They are easy to comprehend and simple to carry out, but to insure 100 per cent performance they must be kept constantly in mind and continuously carried out by both shop and enginemen.

Importance of Correct Maintenance

Correct maintenance in the back shop and the engine house is essential to the best operating results on the road. Unless a locomotive is turned out in first-class condition, first-class performance, from an operating standpoint, cannot reasonably be expected from it. The superheater requires a minimum of attention to keep it in good condition. If it is not given this attention, the superheater *may* be injured; but the performance of the locomotive certainly *will* be injured.

Clean Flues

Correct flue cleaning must be a matter of shop routine. Don't wait to clean the flues until there is a steam failure and

a delayed train. Keep them clean all the time and prevent the failure. It is not only the cheapest in the long run, but it is the easiest. To knock a little clinker off one or two units, and blow a small accumulation of soot and cinders through into the front end with a $\frac{3}{8}$ -in. pipe on the end of an air hose is a small job. However, with 15 or 18 large flues and 40 or 50 small ones plugged solid with cinders for several feet and the cinders embedded around the superheater units so that a bar has to be used to loosen them, the job of flue cleaning assumes considerable proportions. It is prevention that is needed; not cure.

Dampers

Consider for a moment what happens in the locomotive with a hot fire in the firebox if the crown-sheet is permitted to become dry. A similar condition exists with the units when the throttle is closed in a superheater locomotive which has no damper. The same condition applies when the throttle is closed and the damper has been fastened in the open position. When the throttle is closed, steam ceases to flow through the superheater units and there is then nothing to absorb any heat which may be delivered to the unit pipes. If the hot gases continued to flow through the large flues, particularly with the locomotive drifting at high speed, the units would become overheated. While damage might not be evident after a single occurrence of this kind, continued overheating will break down the structure of the material and damage the units.

The Effects of High Water

In the operation of superheater locomotives, the water should always be carried as low as the service conditions will permit. It should be impressed on hostlers and others who move locomotives around shops and terminals that flooding the boiler is bad practice. It will result in water going over into the superheater under conditions favorable to the formation of scale; it also encourages leaky units, both of which are followed by a falling off in the performance of the locomotive when it is on the road.

Lubrication and Drifting

The successful lubrication of superheater locomotives presents no very difficult problem. Careful study of conditions will generally indicate their cause and suggest means of overcoming it. So-called carbonization of oil in the cylinders is caused by the admission of air when the cylinders are at temperatures above the flash point of the oil and by unconsumed gases being drawn into the valve chambers and cylinders through exhaust. The practice of drifting with a slightly opened throttle should always be followed. The use of oil having a flash point above the temperature of the steam is also recommended. Experience has demonstrated that the admission of oil to the valve chests only does not provide the necessary lubrication for the cylinders as satisfactorily as when oil is fed directly to them.

The Problem and Its Solution

Clean flues, dampers in good operative condition, units well maintained, water carried at the right level—all of these must be. And they can be, easily, if every one will do his share. Prevention must be borne in mind and acted on by all. There is no other machine of which it is more true than of the locomotive that "an ounce of prevention is worth a pound of cure." Prevent plugged flues by cleaning them regularly, when cleaning them is only a little job; prevent disabled dampers and damaged units by reporting and having completed the little jobs; carry the water at a reasonable level and prevent a loss in superheater capacity; drift with the throttle cracked and prevent lubrication difficulties. Prevention is easy and is economical. Cure is difficult and expensive;

it means overtime, delay and loss of service engine-hours.

The items that have been considered for the most part, pertain in particular to the superheater, but the importance of other things must not be overlooked. Correct steam distribution, absence of steam leaks, good maintenance of machinery and proper drafting are all matters of as vital importance to the superheated as to the saturated steam locomotive. But in these, as well as in those features which are more closely related to the superheater, the policy of prevention by overcoming small difficulties when they are small, is the simplest and easiest way to produce the results which must be obtained. On the roads which followed this policy, there was a minimum of difficulty experienced last winter. Their example lies before us and all must begin to profit by it now in order to realize the best performance from the superheater locomotive during the winter ahead.

The report was signed by Joseph Keller (Lehigh Valley), chairman; Frederick Kerby (Baltimore & Ohio), Hugh Gallagher (Atchison, Topeka & Santa Fe), J. A. Cooper (Erie), and W. A. Buckbee (Locomotive Superheater Company).

DISCUSSION

Joseph Keller, chairman of the committee, after reading the report spoke of some tests that were made regarding the lubrication of superheater locomotives which were not completed in time to be included in the report. A vacuum gage was applied to the valve chamber at the point where the relief valve is usually located, to determine the amount of vacuum obtaining under varying conditions. The tests were made on Pacific and Mikado locomotives having a 1 inch and a $1\frac{1}{4}$ -in. steam pipe leading to the cylinders for the purpose of admitting steam while drifting. In a test at 45 m. p. h., with the drifting valve wide open, the vacuum varied from 26 to 36 per cent. With the valve closed it increased to 50 and 66 per cent. In some cases a vacuum of about 80 per cent was obtained with the drifting valve closed. In every case the amount of vacuum was considerably greater with the drifting valve closed than when the steam was being admitted to the cylinders through the drifting valves. This indicated that regardless of the fact that drifting valves are used there is an opportunity for the cylinders to suck in gases from the smoke-box. An analysis of the carbonization found in the valve chamber of the Mikado locomotive showed that 27.72 per cent was oil matter, 23.17 per cent was iron and 59.11 per cent was coke. This shows that the walls are abraded and iron filings contribute to the carbonization matter. It also shows that some of the smoke is drawn back through the exhaust nozzle. These tests indicate the necessity of preventing a partial vacuum forming in the cylinders.

F. P. Roesch, fuel supervisor of the Railroad Administration, spoke of some tests made on the El Paso & Southwestern in which it was found that it required a 2-in. steam pipe to keep the cylinder drifting valves closed while the locomotive was drifting, and that the supply of steam for this purpose was very large. He suggested that steam be admitted to the exhaust side of the piston in an endeavor to break the vacuum and at best to dilute the gases drawn into the cylinders. As an example of this he referred to the operation of the old time water brake. He spoke of the necessity of properly maintaining superheaters and of the importance of not carrying the water in the boiler too hot.

F. Kirby, Baltimore & Ohio, called attention to the fact that a leaky front end door or steam pipe will greatly affect the efficiency of the superheater. He was very much in favor of the use of pyrometers in order that the engine crew may better watch the performance of the locomotive. It also gives an indication of the condition of the locomotive. If the proper degree of superheating is to be obtained, the efficiency of the locomotive will be greatly diminished by

keeping the water too high in the boiler. This not only reduces the efficiency of the superheater but injures the superheating joints. The hostler is responsible for a great deal of this trouble. The proper level for the water should be found and marked on the glass. In commenting on cylinder lubrication he has found by tests that unless the valves are in good condition the cylinders will not be properly lubricated. He has found that it is best gradually to close the throttle on superheater locomotives when coming to a stop. The maintenance of the superheater will be greatly increased if the locomotive is not handled properly. On the Baltimore & Ohio each fuel supervisor is provided with a pyrometer which is applied to locomotives not performing properly as the occasion demands.

Other members spoke of the necessity for proper maintenance of superheater locomotives if the full efficiency of the superheater is to be obtained. One member has found that the cooling of the fire in order to prevent popping reduces the degree of superheat sufficiently to affect materially the efficiency of the locomotive.

Railway Fuel Conservation

By Eugene McAuliffe,

Manager Fuel Conservation Section, Division of Operation,
United States Railroad Administration

There is no governmental function of greater importance in existence today than that of the United States Railroad. Men have said that food would win the war; that fuel, that men and munitions, that ships would win the war. They will, after the United States Railroad has gathered the grain, the coal, the iron, the lumber, and all the other raw materials, and transported them to the mill, furnace, and factory, to again move the finished product to ship-side. I am wondering whether or not we have measured up the job that remains for "the second line" to complete! Perhaps we do not all realize that the first two million were largely made up from the ranks of college students, the younger professional men, and those who were not closely tied into the world's affairs. The call for 2,000,000 more men which was just issued will cut deeper into the ranks of industry than did the first call. That means that there can be no slackers in the office, the shop, the cab or caboose; no slackers in the mine or the factory; it means a full day, a full hour, and a full moment for us all. It means work and save, and that is our duty, and to you who lead and plan and direct, it means double duty.

I have consistently said that the men officering and operating the railroads, knew how, could, and would save fuel. It is simply a question of how to do the most with the means at hand. To take a skilled man out of service as an instructor, creates a demand for an unskilled or partially skilled man to take his place; to make extensive changes in locomotives, shops, coaling stations, etc., means heavy drafts on labor and material. All this should be done, but done in an orderly way. The real issue is that of getting every man to do the things he knows best how to do, with the means at hand. Saving fuel means saving everything else chargeable to locomotive operation; it means the expenditure of skill that decreases boiler and machinery repairs, decreases maintenance costs, decreases overtime losses; the wasteful use of fuel means the opposite.

The trouble with the fuel end of the railroad where it is given any measure of consideration at all, is that it is generally looked upon as a mechanical department function, when in fact it really reaches into and overlaps every department of the railroad. The conservation of railway fuel begins at the mine, thence over

the track scales, on to the coaling station, through the breaker bar into the pockets, thence to the tender and the furnace door, not to end at the stack mouth but to begin again at the drawbar and sweeping back it embraces the trainmen, the despatchers, the yardmasters, the signal men, the men in charge of air brake maintenance, the men in charge of lubrication, the maintenance of way men, from the chief engineer down to the trackmen, the superintendent and his assistants. They too save fuel and waste fuel with the rest. The fuel job is an operating department job and just so long as it is looked upon as an annex of the locomotive department, just so long will its economic possibilities be dwarfed and stunted.

The man who is responsible for the operation of the road should seize this greatest of opportunities for increased efficiency by organizing a fuel department, drawing on the mechanical department for the best men it can spare, mechanical department training alone fitting a man for the most important work. This man should be big and broad enough to do justice to the mechanical department which has in times past been combed for results while other departments went free. To save fuel, work must not alone be done with the men in the cab and the shop, but with all the men on the whole line and back to the coal mine. This man I would call a Superintendent of Locomotive Operation and he should have an assistant for each seventy-five locomotives, such an assistant to be a man of the capacity of a first class traveling engineer to help cover the field I have mentioned. In addition a sufficient number of skilled firemen should be detailed as firemen instructors to admit of giving each new fireman a proper measure of training when road service begins. The fireman instructor should also be given charge of the work of training the fire cleaning force at terminals, which duty will bring him in touch with the real pulse of the locomotive end of fuel economy, the dirty fire. The motive power department may need one or more traveling engineers for work other than fuel economy; the superintendent may require one or more assistants to pursue investigations, etc., but these men should be apart from the locomotive operation organization whose function should be, the conservation of fuel in all its collateral relations.

The supervisors attached to the Fuel Conservation Section, the department I speak for, find in many places certain outstanding conditions requiring correction, I will enumerate a few only:

Things are never quite as well as the men who live with them daily think they are; for example: nozzle and front end standards are not maintained; this is frequently due to front end leaks, stopped up flues and superheater tubes, dislocated brick arches, dirty boilers, etc. Try opening the front end of a dozen locomotives, then look down the stack.

The stationary steam plants of the average railroad are badly designed and indifferently maintained; air leaks in brick settings; cracks in fire walls and behind fire arches with short circuiting of gases; lack of stack dampers; an unwholesome disregard of radiative losses, both on boiler sheets and steam lines; leaking water and steam valves, no attempt made to use exhaust steam for heating feed water or buildings; fuel supply exposed and wasted; no facilities for cleaning tubes, etc. I will not speak of the general disregard of the value of gas analyses and CO₂ determinations in the larger plants.

Open fires in switch and roundhouse yards, the best of lump coal used.

Overloaded tenders with coal littered all over coal chutes, roundhouse and freight yard tracks; look your hump yard over, it will surprise you.

Cars leaving coal chutes with from 500 to 2,000 lb. of coal in pockets.

Tenders that leak coal through the side and gangway and through holes around the grate rigging; shop tenders standing half filled with coal for weeks; road and yard engines that carry coal on sides of tank and over water cistern to mix with cinders and become valueless.

Caboose stored with lump coal, the stove red hot with the

doors open; steam heated coaches cooled by opening windows and ventilators; switch shanties with open doors and red hot stoves; coal piled outside on the ground in a pile so profuse as to shout "welcome."

Badly made up trains, box cars moving in trains with open doors, increasing train haul resistance.

Excessive standby time at initial and destination terminals, resulting frequently from lack of co-ordination between mechanical and transportation men.

Wasteful firing of engines on roundhouse tracks; fine coal losses through grates when firing up engines, and the dumping of half consumed coal put in fireboxes just before engine is placed on cinder pit tracks.

A disposition to let the brick arch saving and the superheater saving carry distorted steam distribution, defective valve and cylinder packing rings, and dirty boiler losses.

Indifference to fuel and other losses chargeable to improper lubrication of moving parts, including the internal lubrication of the locomotive as well as freight train journals.

Train line leaks. Men who should know say freight train line leaks absorb ninety-five per cent of the air made by locomotive compressors and consume six million tons of coal annually; a six-pound per minute, leak under a fifty car freight train consumes, when supplied by single stage compressors, 800 or 900 lb. of coal in ten hours; a fifteen-pound leak will require the service of two single stage air compressors and consume 2,600 lb. of coal in ten hours. I have reports of seventeen pounds leakage on the engine and tender, and sixteen pounds per minute under a train of 46 freight cars. The remedy lies in the repair shop and yard; with the switchmen who fail to cut hose by hand and in the crash and bang that takes place in switching and hump yards. The single stage compressor should give way to the cross compound using one-third the steam, and producing more air, with decreased radiative losses. Let me impress on you that the single stage air compressor with the air end running at a temperature of 200 to 400 degrees Fahr. is the most extravagant steam user ever constructed as measured by results obtained; this fact alone should be sufficient justification for reducing train line leakage losses.

The heroic women of France are rationed on fuel, a family of five or six get a wash basin full of coal daily, with which to cook, to heat, to cleanse. Coal like liberty has been so free with us that we find it hard to attach a sense of value to it; the value is there, however; not alone a money value, but a value that flows from an insufficient supply and we must recognize the fact.

It is not the function of the Fuel Conservation Section to do the work of conserving fuel, that work like everything else connected with the operation of the railroads goes to make up the work of the men who man and officer the several lines. We will point the way and help you all we can.

Progressive managers are in many cases forming fuel saving organizations of the character outlined above; only a few have not as yet moved. On the whole the awakening to this situation is startling. I am arranging to make every paid railroad fuel inspector a representative of the United States Fuel Administration Inspection force, increasing their authority and usefulness. Where information reaches me that a railroad is being discriminated against in its fuel supply an immediate investigation is made and a remedy applied. The United States Fuel Administration is working hard for cleaner coal and the effort is bearing fruit. What we want is interest, human interest, individual endeavor, a certain and defined recognition of the fact that coal and fuel oil today, while more costly than ever before, have a value beyond price.

For the past few days the name of Lens, a coal mining town in northern France, has stood out sharply in the war news headlines. For three years, the contending armies have surged back and forth on the outskirts of this city, the center of the most important coal field in France. French guns stationed behind the refuse piles surrounding these deep coal pits yielded reluctantly to the enemy. The surrounding terrain is a grave yard, twenty-five thousand allied troops falling there in one battle. For what was this toll of human life? For coal. The Allies are in Lens again. When you hear the name of Lens, think of coal.

Fuel Economy

Never before in the history of the nation has there been a time when the fuel supply was generally inadequate to the demand, and never before was it so essential that our industries should be maintained at their maximum rate of production. It is realized now that upon the United States rests the hope of all the free people of the world, and it is not too much to say that the realization of this hope depends in no small degree upon the effective distribution and use of the available fuel supply.

According to the official figures in 1917 the railroads consumed 158,000,000 tons of coal. Estimates of the Fuel Administration indicate that the consumption in 1918 will aggregate 166,000,000 tons, an increase of 7 per cent over last year. It is believed that this entire estimated increase can be avoided and a substantial saving effected over last year if the earnest co-operation of every railroad employee can be enlisted in the application of individual economies.

A few weeks ago the United States Fuel Administration in an official statement said that "a saving of 60,000,000 tons of coal was the one possible avenue of escape from national disaster. The necessities of war must be supplied. The coal deficit must inevitably come out of the necessary fuel for non-war industries. These industries employ millions of our population and furnish the backbone of our national wealth. Factories will shut down and men be out of work in proportion to the coal deficit. Every ton of coal saved will keep fifty workmen from idleness and permit additional creation of several hundred dollars of national wealth."

Of the 60,000,000 tons of coal that the Fuel Administration states it is necessary to save, a million and a quarter tons per month could be saved by simple methods of economy that any man using fuel on a railroad could at once apply, without a minute's delay for additional appliances or personal instruction. These men have only to be impressed with the importance of the subject to make this potential saving a practical reality, and the committee believes that every road foreman, supervisor, traveling engineer and fireman should be acquainted with the situation so that its importance may be understood by every engine crew in the country.

But this probable shortage in the supply is not the only factor that demands our consideration. The fact is, that in the opinion of the fuel administrator it is physically impossible to transport all the coal needed so that it may fairly be concluded that the difficulty is mainly one of transportation. This means that for every pound of coal saved, a pound of another needed commodity may be transported and in the same proportion may the present traffic situation be relieved and subsequent congestion avoided.

In its first report the committee provoked some discussion because of its comments in respect to the purchase of coal to specifications naming a definite standard of quality. The necessity for utilizing all the coal in the ground was then emphasized and to this principle there can be no dissent. In the past three years, however, the increasing demand for coal has unquestionably resulted in a deterioration in the average quality, while in the face of actual shortage, industrial plants have accepted a grade of fuel undeniably inferior to previous averages. This has resulted in correspondingly reducing the quality furnished the railroads. The shipment of slate, bone, rock and other impurities familiar particularly to users of bituminous coal reduces the available units of transportation, increases the cost of labor per ton of combustible transported, unloaded and utilized, reduces the efficiency of power plants, increases the necessity for excess plant capacity, not infrequently actually reduces plant output and always impairs locomotive performance both directly by reducing operating efficiency and indirectly through the consequent increase in

the cost of repairs. For these considerations, a reasonable improvement should now be demanded in the quality of all coal loaded for railroad use. It would not be unreasonable to require the pre-war competitive standard.

There is not an element of locomotive maintenance that does not in some degree affect fuel consumption. One of the most frequent causes of poor steaming locomotives is a leak in the boiler front door or frame, which is frequently compensated for by a reduction in the area of the exhaust nozzle, thereby placing a double burden upon the boiler and the coal supply further back. Every report of a poor steaming locomotive now requires immediate and special attention. We should so organize and instruct our forces as to insure prompt investigation and the application of the proper remedy in every instance.

In addition to the physical condition of the locomotives and their efficient operation, there are a number of particulars in which the motive power department may prove the effective agency for fuel conservation. These may be grouped under two headings: Those relating to the locomotive and those to engine-house conditions.

Probably there is no single source of immediate and absolute waste as great as the ash-pit. Every pound of unconsumed combustible that finds its way to the ash-pit is a direct loss and the total aggregates huge proportions. It is impossible to eliminate this waste entirely, but it can be minimized by proper firing methods so that the locomotive will reach the pit with a light fire, by dumping the engines as soon as possible after arrival at the ash-pit so that the use of green coal may be avoided, and by prompt movement from the pit to the engine-house. Another prolific source of ash-pit waste is caused by defective crane buckets and careless crane operation. Coal is lost through the buckets into the ash-pit. There are frequent instances where the boiler washing program is not transmitted to the engine despatcher so that locomotives are dumped and fired up again before it is decided that they are to be washed, thus necessitating a second trip to the ash-pit. It is safe to estimate that with a modern locomotive a loss of not less than four tons of coal is involved in this proceeding. Cars unloaded with a clam shell bucket are frequently reconsigned to the mines with coal in the hopper amounting to a ton or more. Our transportation necessities now demand that empty supply coal equipment be examined by the coal pocket foreman and every pound removed before the cars are reconsigned.

Two other factors require mention; unnecessary movement of engines, and excessive use of air pumps.

There are innumerable particulars in which engine-house auxiliaries may increase the fuel cost. Relatively, the coal consumption is small compared to that of locomotives, but the necessity for economy should lead us to investigate every avenue of waste.

Some of the essential points that will in some measure aid in economy of fuel are brought out in the following suggestions:

1. The selection of fuel that is clean and of as high a heat value as can be obtained on the line of road or as close to the line of road to be supplied as possible.

2. All fuel should be inspected to see that it is reasonably free from slate, sulphur, shale bone and other impurities that are non-combustible. Such impurities only take up room in cars, coal pockets and on tenders that should be occupied by clean coal, help to fill up the firebox and form clinkers which in turn are responsible for engines failing for steam and delays that thoroughly disorganize despatching, keep crews out on the road many hours after they should have arrived at the terminal and in many cases cause crews to be tied up between terminals on account of the hours of service law. In addition, there is the effect of dirty, clinkered fires on firebox sheets and boiler tubes.

3. Locomotives should be equipped with modern fireboxes with brick arches and combustion chambers so that when coal is applied to the fire the gases that are given off will burn and aid in steam-making instead of passing out to the atmosphere unburned. The installation of a combustion chamber results in an increase of both volume and heating surface, but the added heating surface is of little value if the firebox volume is not to be utilized and filled with the flame. With a restricted air opening or a heavy fire, much of the fixed carbon is burned to carbon-monoxide and this combustible gas must then be burned in the space above the fuel bed, in addition to the hydro carbons. With a fair grade of bituminous coal or ordinary firing methods, fully 50 per cent of the heat generated in the firebox is due to the burning of combustible gases above the fuel bed, and in order to burn them completely it is necessary to have an adequate supply of oxygen above the fuel bed. The more intimate the mixing of the gases and the greater the supply of oxygen, the quicker will the flame burn and the shorter will be its length; otherwise combustion is apt to be incomplete. It is therefore apparent that to produce perfect combustion, it is as necessary to provide for air above the fuel bed as below.

4. Coal should be prepared by having it broken to the proper size for firing and thereby eliminate the wasteful habit of some firemen of throwing large lumps of coal into the firebox or throwing them off along the right-of-way.

5. It has been the habit of a large number of roundhouse foremen on many roads to fire up engines as soon as it is seen that whatever work there is to be done on an engine is near enough done that they may accept an order for the engine, regardless of whether the engine is ordered out or not. Almost any engine can be gotten ready for service, even after a wash-out, in not to exceed one hour and thirty minutes, and no engine should be fired in excess of this amount of time before a call. Some yardmasters are also prone to order engines when they know the train to be handled will not be ready on the call, and sometimes hours elapse before such trains are ready, but the engine is burning coal all the time.

6. In coaling up engines at terminals or at coaling stations along the road, care should be taken in regard to overloading tenders, as this is not only wasteful, but very dangerous to employees and others. Coal chutes should be installed of such a design that tenders can be coaled without the liability of trouble with the chute that would cause coal to be spilled on the ground. Coal that is spilled on the ground should be kept cleaned up.

7. Engines should be drafted, if possible, to burn one grade of fuel, and a reasonable effort should be made to keep that grade of fuel on the division to which the engine is assigned. Draft appliances should have a standard setting for each class of engines and the grade of fuel to be used. It too frequently happens that, if a certain crew has steam troubles, changes are made in draft appliances when there is nothing wrong except improper firing or improper operation of the engine. Changes are also made in draft appliances to overcome such defects as leaky steam pipes, leaky exhaust stands, leaky units or air leaks around the smoke-arch door and steam pipes where they pass through the smoke-arch shell, etc.

8. Engines should at all times be operated with the idea of doing the work assigned as economically as is consistent. A watchful and consistent engineer can accomplish much that will aid in fuel economy if he will at all times note any defects that would increase the consumption of fuel and have necessary repairs made on arrival at the terminal. Conditions that cause the engine to burn an excessive amount of fuel should always be given due consideration by both engineer and fireman and the foreman in charge at the terminal where such work is to be done. Steam leaks at steam pipe joints, exhaust stands, header and unit connections, pop and

whistle valves, piston rods and valve stems or any leak that will permit steam to pass out to the atmosphere without first aiding in the "pull at the drawbar" should at all times be kept to a minimum.

10. Valves, valve rings and cylinder packing blowing are liberal contributors to excessive fuel use. Superheater and small tubes partially or wholly stopped up with ashes or clinkers are responsible for cutting off a great deal of heating surface and changing the effect of the draft on the fire.

11. Permitting excessive brake pipe leakage to exist causes air compressors to use far in excess of the amount of steam they should use to maintain the desired pressure. If brake pipe leakage were reduced to a reasonable minimum, it would aid materially in fuel economy.

12. The valves and cylinders of the locomotive should be kept well lubricated to avoid operating the engine against dry valve seats and cylinder walls.

The problem has been and perhaps always will be the educating of firemen. Lack of proper supervision or the necessary interest on the part of the fireman himself, and sometimes both, are in a great many instances responsible for men being wasteful as long as they remain firemen and when promoted they are unfit to educate new men.

Almost every man firing a locomotive today, with careful, consistent firing, could save at least one scoop full of coal for every mile run. With this accomplishment, we would save many thousand tons of coal every year, which would in turn furnish steam to haul many thousand tons of food stuffs, clothing and ammunitions.

War conditions have wrought many changes that have made it necessary for the railroads to sacrifice many of their most efficient firemen for military service, leaving their places to be filled with unskilled men, who for a time, with the best of supervision, are bound to be expensive men. A large number of these men are also subject to military service and about the time they become fairly efficient firemen they are called to the colors and another place is left vacant again to be filled by an unskilled man. The committee fully appreciates the necessity of these men responding promptly to the call of duty in a time like the present, but speaks of these conditions to indicate the necessity for closer supervision over men newly employed as firemen, to properly educate them along the lines of economy in the use of fuel.

Let us not forget that to win the war and shorten the time of its winning, we, who have been left at home, must use every ounce of energy we possess, both individually and collectively, in producing the necessary commodities to accomplish the end in view and conserve in every way possible any commodity that will assist in winning the war, especially food stuffs and fuel.

The report was signed by E. Hartenstein, chairman, and N. E. Preston, F. R. McShane, W. L. Robinson, and A. G. Turlay.

DISCUSSION.

Eugene McAuliffe spoke of the poor quality of the coal supplied in 1917. The ash content increased five or six per cent over 1916, which resulted in a great deal of trouble in operating locomotives. The Fuel Administration has been trying to improve the quality of the coal as well as increase the production. There has already been a marked improvement in the situation.

F. P. Roesch, fuel supervisor, Railroad Administration, mentioned the waste of fuel due to drifting down long grades with steam on. He also spoke of the importance of saving fuel which is now an end in itself aside from the question of saving money.

V. C. Randolph, fuel supervisor, Railroad Administration, stated that in his opinion economy in the use of fuel could only be effected by the individual efforts of the engineers and

firemen. Their efforts will save more coal than all the appliances that can be put on a locomotive.

H. H. Schulte, Lehigh Valley, told of the decreased fuel consumption that had been brought about by increased supervision.

H. M. Curry, Northern Pacific, spoke of the waste of fuel due to raising steam on locomotives without sufficient time for doing the work without forcing the fire.

T. F. Lyons, New York Central, called attention to the importance of reducing brake pipe leakage. By fastening the brake cylinder and auxiliary reservoir rigidly to the underframe, the leakage can be greatly reduced and much fuel can be saved.

L. R. Pyle, fuel supervisor, Railroad Administration, urged the men to give coal the attention which its importance justified. On the majority of roads fuel is handled carelessly, as if it were of slight value.

W. G. Tawse, Locomotive Superheater Company, told of a case where $4\frac{3}{4}$ tons of coal per trip was saved on a 127-mile division by cleaning out superheater flues which were stopped up.

J. Keller, Lehigh Valley, spoke of the utilization of silt from the anthracite culm banks by mixing it with bituminous coal.

J. B. Hurley, Wabash, mentioned the saving of fuel secured through the elimination of boiler scale and the attendant increase in the flue mileage; he also spoke of the benefits of using brick arches, particularly where the coal has a large percentage of slack.

A. N. Wilsie, Burlington, expressed the opinion that a pyrometer was of great assistance in saving fuel and aided greatly in securing the full efficiency from stoker fired engines.

Robert Collett, fuel supervisor, Railroad Administration, called attention to the need of determining what the fuel conditions on the railroads actually are. He also spoke of the futility of putting fuel-saving devices on locomotives and not maintaining them properly. Other members talked of the necessity of preparing fires correctly at the terminals, of the waste due to steam leaks, and the loss of fuel at ash pits. Several of the speakers described systems of accounting for fuel and organizations developed for the purpose of securing co-operation of all departments in saving coal.

Maintenance of Air Brakes

[The exact title of this report was "How Can the Traveling Engineers and General Air Brake Inspectors Best Cooperate to Improve and Maintain the Air Brake Service?"]—Editor.

It is hard even for those who have been in constant touch with railroad development to realize just how fast the tonnage handled by the railroads has been increased during the last few years, and what efforts have been necessary on the part of the railroads and manufacturers of railroad equipment to meet the requirements of safely, promptly and economically handling this increased tonnage. The increased weight of locomotives and cars, as well as the increased number of locomotives used to handle a train (as many as five locomotives are used on one train on some of our mountain roads), has resulted in a constant increase in the length of trains and the tonnage handled per train, all of which has exacted more care in handling and greater efficiency in the maintenance of air brakes.

The air brake manufacturers, to meet the more exacting conditions imposed on the air brakes, have made every effort to improve and change the equipment to meet the requirements. Although the improvement in brake equipment for both locomotives and cars has been rapid, it is doubtful if it has kept pace with the requirements, and a higher state of

maintenance than was required a few years ago is now necessary if we expect to get the desired results.

We believe that practically all air brake troubles that cause delay and damage to equipment are avoidable; also, that they are due either to a poor condition of maintenance or improper handling. Where improper handling is the real cause, a continuation of the trouble is almost inexcusable, as most men handling equipment are glad to handle it properly if the right way is pointed out to them. As the traveling engineer and general air brake inspector are looked to by the men for proper instructions, it follows that close co-operation regarding the best methods of handling is absolutely necessary on the part of the traveling engineer and general air brake inspector. Where such co-operation does not exist it will generally be found that the men have little confidence in instructions given by either, and they will handle the equipment according to their individual ideas.

It is the general opinion of men coming in close contact with road delays that can be directly traced to air brake defects, that such delays are avoidable and in most cases can be traced to poor terminal inspection and failure to make proper repairs or to a poor general condition of maintenance. This applies particularly to freight service.

The incoming test of trains as a remedy for yard and road delays caused by air brake defects is one that has been advocated by general air-brake inspectors for years, but up to the present time their recommendations have been disregarded. This fact may be due in part to their failure to make the importance of the incoming test realized by operating officials, but surely the mistake of allowing a car that arrives at a terminal or repair point with a defective brake to be switched into an outgoing train, is as inexcusable as allowing a defective engine to remain in the roundhouse without inspection and discovering the defect after coupling to a train or after an engine failure occurs on the road. We believe that if the traveling engineer and general air brake inspector would co-operate in keeping the importance of the incoming test before the operating officials it would result in a practical system of incoming inspection being adopted in all yards, that would materially decrease delays and damage to equipment and lading.

The use of inferior low-cost material in air brake repairs is responsible for more or less air brake inefficiency, and under the present cost of labor there is no doubt that the use of such material is much more expensive than the use of the best material, even at a higher price. While the traveling engineers and general air brake inspectors do not, as a rule, have much to say regarding the purchase of material, we believe that their co-operation in keeping the attention of higher officials on the quality of material being used would in many instances result in the best material being furnished; this in most instances would result in more lasting repairs being made, which means a higher efficiency and lower total cost of maintenance.

It has not been the intent in preparing this paper to go into detail regarding the best methods of obtaining the desired results, as local conditions have much to do with the details of maintenance of equipment, and the rules of most of the large roads already require the following of recommended practice as laid down by the Air Brake and Master Car Builders' Association. Closer co-operation between traveling engineers and general air brake inspectors would assist in such rules and recommended practices being more closely followed, which would result in improving and maintaining the air brake service.

The report was signed by E. F. Wentworth (New York Air Brake Company), chairman; W. V. Turner (Westinghouse Air Brake Company), A. G. Huston (Virginian Ry.), J. B. Hurley (Wabash Ry.), and L. R. Pyle (United States Railroad Administration).

DISCUSSION

The keynote of the discussion was that the traveling engineers and the airbrake inspectors must co-operate to the fullest extent. The duties of each of these classes are so extensive that it is impossible for each to excel in the field of the other. Airbrake problems must be referred to the air-brake men and train operation problems to the traveling engineer. A great deal of the trouble in handling trains is due to excessive train pipe leakage. This should not exceed eight pounds per minute and in any case it should not exceed the capacity of the feed valve to charge the line. By keeping train line leakage down the trains can be moved much faster over the division and less fuel will be used. Stuck brakes caused by train pipe leakage has made double-heading necessary in some cases. The leakage should be traced back to the repair tracks and no car should be released until the air brakes are tested and repaired regardless of the cause for which the car was sent to the repair tracks.

A great deal of time will be saved and the equipment better maintained if a thorough test of the brakes is made when a train reaches a yard. On this incoming test minor repairs can be made by the inspectors and the cars requiring heavier repairs should be set out immediately for the necessary repairs. This will reduce the delay of the outgoing test. Locomotives have been found having a leakage of 16 lb. and this should not be tolerated.

A great deal of trouble is caused by the manipulation of the brakes. Many cases were reported where the brakes were not brought to full release before starting, an effort being made to release them with the engineer's valve in the running position. It is the duty of the traveling engineer to teach the enginemen properly to diagnose the air brake troubles in order that detail and explicit reports of repairs can be made. One of the most common causes of train pipe leakage is pulling hose apart and the ramming of cars together in switching yards. The former destroys the hose and the latter destroys the brake pipes and causes the joints to leak. The difficulty of operating passenger trains having P. M. and L. N. air brake equipment, with the supplementary reservoir of the L. N. equipment left in service, has been obviated on the Baltimore & Ohio by using only one train pipe reduction in making a stop, the first application being split to a 10 lb. reduction and then any amount of reduction is permissible. In giving instructions to the enginemen enough information should be included to show them the reasons for such instructions. Difficulties in obtaining proper and sufficient labor to repair the cars were mentioned but it is expected that the increase in wages will hold the men.

Locomotive Cab and Cab Fittings

The many types of engines make a universal design of cab hardly feasible, but it is felt that the following suggestions could be very well adapted to any design of locomotive cab.

Body of Cab.—The overhang of a cab should be of dimensions such as will insure protection from the elements to the fireman. This really necessitates its extension to a point approximately over the coal doors on the tender.

It is the opinion of the committee that the front windows of the cab should be as close as consistent to the engine crews' usual and proper position in the cab. This is to provide a broader view for the engine crew.

The side windows provided for locomotive cabs are as a general rule of the sliding type, and we believe that a sash should be constructed in such a manner as to provide for small panes of glass, for the reason that the portion of frame between window panes forms a brace lessening the liability of breakage, and in case of breakage it reduces the cost of

replacing, and lessens the opening in case of a broken window pane while in service.

Ventilators should be provided and so constructed as to exclude cinders.

Gutters on sides of cab should be located immediately over the windows in such a way as to afford all of the protection possible to the engine crew. The opinion of the engineman is that it should be maintained immediately over the cab window.

Cab Fittings.—Receptacles should be provided for signal appliances, such as lanterns, fusees, flags, torpedoes, etc. Torches, oil cans, hand tools, shaker bars, broom and other portable cab equipment should have convenient receptacles or hangers provided so that they may readily be located by the engine crews.

Boiler Appurtenances.—The steam manifold has been given various locations. Some are inside of the cab directly on top of the boiler, and where two are used they are usually located in the cab on the sides of the boiler near the top. Those located outside of the cab are just forward of the cab on top of the boiler and are provided with rods that extend through the front of cab for the purpose of operating the steam valves on the steam turret. This last mentioned arrangement, that is outside the cab, has numerous advantages over those located inside. It produces a cooler cab in warm weather and a drier cab in the cold season; it lessens the number of steam pipes in the cab and correspondingly decreases in number the pipe holes in cab that are generally hard to seal and keep tight against severe weather.

It is believed that better provisions could be made for the securing of the injector to the boiler. It is suggested that it be provided with a bolting flange similar in a way to the bolting flange on an air pump with a bed plate on the boiler. In cases where injectors are located outside of the cab substantial rods equipped with durable joints and suitable brackets that will keep the rod from turning and thereby change the capacity at times when it should remain constant, should be provided. The operating handles should be located conveniently within reach of the engine crew.

There is no question but that the "Bull's Eye" type of lubricators is most desirable, but the manner in which they are secured deserves greater attention.

Throttle and Reverse Lever.—It is desirable to have the throttle lever so located that it can be readily handled by the engineer and at the same time have his head outside of the window in order to observe signals from either front or rear of engine.

Where a power reverse gear is used an indicator should be provided to indicate the position of the valve gear. When air reverse gear is used, the steam connection globe valve should be located within handy reach of the engineman in the cab, so that the steam pressure may be readily turned on in case of an air failure.

Brake Valves.—Automatic and independent air brake valves in cabs should be located in a manner to provide ample clearance with the handles in any position and so they may be easily operated from the engineman's usual and proper position in the cab.

The report was signed by: J. H. Desalis, chairman; W. H. Corbett, W. W. Shelton, H. H. Schulte and H. F. Henson.

Engine Failures, Causes and Remedies

It has been said that the engine failure reports form one of the best barometers of the efficiency of the mechanical department, and this is indeed the case where all detentions and reported failures are carefully investigated *before* they are recorded. Where the engine failures charged depend, however, on the reports of conductors or on interpretations of the rules by the dispatcher's or trainmaster's clerk, the accuracy of the charge is often open to question.

An engine failure on the line of road is an expensive proposition, more far-reaching in its effects on the movement of trains than is generally realized by mechanical men who have had no road experience, often so upsetting the dispatcher's pre-arranged schedule that we cannot be surprised if he loses his temper and feels like charging every delay, regardless of cause, as an engine failure.

Definition of What Constitutes an Engine Failure

1. All delays waiting for an engine at an initial terminal, except in cases where an engine must be turned and does not arrive in time to be despatched and cared for before leaving time.
2. All delays on account of engines breaking down, running hot, not steaming well, or having to reduce tonnage on account of defective engine, making a delay at a terminal, a meeting point, a junction connection, or delaying other traffic.

Delays That Should Not Be Considered an Engine Failure

1. Do not report cases where engines lost time and afterwards regain it without delay to connections or other traffic.
 2. In cases where a passenger or scheduled freight train is delayed from other causes, and an engine (having a defect) makes up more time than it loses on its own account, should not be called an engine failure.
 3. Do not report delays to passenger trains when they are less than 5 min. late at terminals or junction points.
 4. Do not report delays to scheduled freight trains when they are less than 20 min. late at terminals or junction points.
 5. Do not report delays when an engine is given excess of tonnage and stalls on a hill, providing the engine is working and steaming well.
 6. Do not report delays on extra dead freight trains if the run is made in less hours than the miles divided by ten.
 7. Do not report engine failures on account of engines steaming poorly, or flues leaking, on any run where the engine has been delayed on side-tracks other than by defects of engine, or on the road an unreasonable length of time—say, 15 hr, or more per 100 mi.
 8. Do not report an engine failure for reasonable delays in cleaning fires and ash-pans on the road.
 9. Do not report failures against engines that are coming from outside points to the shops for repairs.
 10. Do not report cases where an engine is held in the roundhouse for needed repairs and called for by the operating department, they being informed that the engine will not be ready until a stated time. Failure to provide that engine before the stated time should not be called an engine failure.
 11. Do not report broken draft rigging on engines and tenders caused by air being set on train, account of bursted hose or breaking in two.
 12. Do not report delays to fast schedule trains when the weather conditions are such that it is impossible to make the time, providing that the engine is working and steaming well.
 13. Do not report delays when an engine gets out of coal and water, caused by being held between coal and water stations an unreasonable length of time.
- If rule No. 2 is correctly interpreted there is no need for the 13 qualifying rules. However, if an engine apparently fails on the line of road, it is charged as an engine failure, although the engine may be in perfect condition and the delay due entirely to other causes, such as mishandling on the part of the crew, either engineer or fireman, excessive tonnage, weather conditions, or any of a hundred possible causes any of which may result in a poor engine performance and for which the engine or its condition is least of all responsible.

The true cause of the poor performance should be deter-

mined by a full investigation, which, however, may not be possible immediately and, consequently, when determined several days may have elapsed before the cancellation of the charge is requested. This being the case, it appears to this committee, in justice to the mechanical department, it would be much more equitable were all doubtful cases simply shown as delays on the "morning report" and these delays then promptly investigated and where the failure is established it be so reported on a subsequent report, or else a monthly report compiled, showing all failures and delays.

Any criticism to be of value must be constructive; therefore, as a first step toward the elimination of engine failures, we would recommend a closer relationship between all departments of a railroad, "get-together" meetings about once a month where engine and train performance can be freely discussed and wrong practices corrected.

We would also recommend that the mechanical department be kept advised as far ahead as possible of any power requirements, so that fitting preparation can be made; where no such system obtains the roundhouse foreman will sometimes take a chance when pressed for power and let an engine go on the assumption that perhaps it can make just one more trip.

A check of the various engine failures extending over a period of two years shows as follows:

FAILURES IN TWO YEARS PER 1,000 MILES OF ROAD	
Air brake and piping.....	15
Ash pan and rigging.....	5
Axle, driving, broken.....	2
Brake rigging.....	3
Boiler studs.....	1
Boiler checks.....	4
Blow-off cocks.....	3
By-pass valves.....	2
Cylinder packing.....	9
Crossheads.....	2
Cylinder heads broken.....	5
Crank pins broken.....	3
Draft gear.....	4
Flues leaking.....	24
Frames broken.....	7
Follower bolts.....	1
Foaming.....	1
Grates and rigging.....	4
Guides and guide bolts.....	5
Headlights.....	6
Hose (air and water).....	3
Injectors.....	1
Journals, hot.....	21
Lubricator.....	1
Pins, hot.....	14
Piston rods broken.....	6
Relief valve.....	1
Stokers.....	12
Springs and rigging.....	6
Tires slipped.....	31
Terminal delays.....	39
Valve gear—Stephenson.....	17
Valve gear—Walschaert.....	16
Wrist pins and nuts.....	3
No steam.....	11
Man failures.....	13
Total.....	329

In the list above presented is it not clearly established that if the provisions of the federal inspection laws were fully complied with in letter and spirit at least half of these failures would have been eliminated, and by the same token would it not appear that one of the logical remedies for engine failures is a strict compliance with the federal inspection rules? An analysis of the above reported failures shows that at least 50 per cent should have been preventable in so far as mechanical failures are concerned and practically all of the man failures likewise.

Let it be understood that this report is not intended to reflect discredit on the enginemen, but rather on the methods in use on too many of our railroads. New devices are continually being applied and too often men are expected to familiarize themselves with these with no other instructions than that contained in descriptive pamphlets. One ounce of ocular demonstration is worth a pound of reading in such cases, and we feel that enginemen should not be condemned for lack of knowledge where no adequate means for instruction obtains. We feel that all new methods or devices should be thoroughly explained and demonstrated to the men whose duty it is to operate or work with them, before we can place

ourselves in position to criticise. Every roundhouse where repairs are made can be fitted up with instruction rooms, containing charts or models, or both, and certain hours or dates can be set when instruction will be given. Then if the men do not avail themselves of the opportunities offered, action can be taken in case of man failure.

The report was signed by F. P. Roesch (United States Railroad Administration), chairman; J. R. Scott (St. Louis-San Francisco), J. N. Rafferty (Atlantic Coast Line), C. W. Irving (Norfolk & Western), and W. F. Perkins (Norfolk & Western).

The Railways in the War

By Samuel O. Dunn

Editor of the *Railway Age*

On the first occasion when I addressed you (in 1911) the two subjects pertaining to the railway business which were uppermost in the public mind where those of advances in rates and of operating efficiency. The Interstate Commerce Commission had just recently decided the first important case which the railway companies instituted to secure general advances in rates. You will recall that the Commission refused to permit the advances upon the ground that they were unnecessary.

The decision rendered at that time affords a striking contrast to certain steps which recently have been taken, and which have resulted in passenger rates being advanced about 50 per cent. and freight rates about 25 per cent. One cannot help wondering what would have been the course of developments in the field of transportation if the Interstate Commerce Commission had seen the light at that time, and granted the advances in rates which subsequent developments have conclusively demonstrated were needed.

Recalling that decision of the Interstate Commerce Commission caused me to recall also the most sensational development which occurred in the hearings in that case. This was the attempt of Mr. Louis D. Brandeis, an attorney for the shippers, to show that the railway managements, by the application of the principles of so-called "scientific management," could reduce their operating expenses one million dollars a day. The railways are now being operated as a single system by the Government. Expenses are increasing more rapidly than ever before. This, therefore, would be a most opportune time for those in charge of their management to put the principles of Mr. Brandeis to the crucial test. But they are not doing so—one circumstance among many which indicate that the attacks which were made upon the railway companies for alleged operating inefficiency were as unjust as many attacks which have been made, and are still being made on them upon other grounds.

While, however, the railways did not display much alacrity in applying the principles of Mr. Brandeis, they did show great alacrity and energy in adopting every feasible means for increasing the efficiency of operation. The statistics of the Interstate Commerce Commission reflect in a striking manner the results obtained. In 1911 the number of tons carried one mile per freight locomotive was 6,913,259. In 1915 the figure had been increased to almost 10,000,000, or almost 50 per cent. In 1917, the last year of private operation, the average number of tons of freight carried one mile by each locomotive was 12,636,545, an increase over 1911 of 85 per cent. This enormous increase in the amount of freight traffic handled by each locomotive was due both to increases in the average tons hauled per train, and in the average miles made per locomotive. The average tons per train increased from 383 in 1911 to 649 in 1917, or 59 per cent. The average miles traveled per locomotive per day increased from 55½ in 1911 to 67 miles in 1917, or 20 per cent.

It is impossible accurately to estimate the amount of saving in operating expenses which was caused by this great

increase in locomotive efficiency; but it amounted to literally hundreds of millions of dollars annually. There is now a tendency manifested in some quarters to attempt to make it appear that the inefficiency with which the railways were being operated made it necessary for the Government to take them over. I do not criticize the Government for taking charge of railroad operation. As an American citizen, I should feel deeply gratified if under Government control the operation of the railways should be made far more efficient than it was under private management. The highest efficiency in railroad operation is essential as one important means to winning this terrible war for democracy and humanity. At the same time I challenge as without foundation the allegation that the inefficiency of private management made necessary the adoption of Government control. The facts demonstrate beyond question that in the last year of private operation the power of the railways as a whole was more efficient and was operated more efficiently than ever before. The same thing may be shown as to every branch of operation.

How was this great increase in locomotive efficiency attained? It was attributable partly to the work of the managers and officers of the railways, including the members of this association, who have direct charge of the operation of the locomotives. It was partly due to the work of the builders of the locomotives and of the numerous concerns which are engaged in the manufacture of the specialties used on equipment. The best type of locomotive will not produce good results unless it is skillfully operated. On the other hand, the most skillful railway motive power officer cannot get the best results except with locomotives that are well designed, well built, and equipped with the most modern devices. The increase in locomotive efficiency has been due to the fact that, on the one side, there has been constant progress in the design of locomotives and in the invention and introduction of new devices to make them better machines, and that, on the other hand, there has been constant improvement in their operation. The work of those who have operated the locomotives and of those who have engaged in inventing and perfecting new devices for improving them have constantly reacted, one upon the other, and the result has been the wonderful progress to which I have referred.

This co-operation between the railways, on the one side, and the locomotive builders and specialty manufacturers on the other, will be as essential to continued progress in the future as it has been in the past.

We have heard a great deal within recent months about standardization of locomotives. I do not intend to discuss that matter here. There is, however, one thought regarding it which I desire to leave with you. This is that progress in design is far more important than standardization of design. I question very much whether, if an extensive program of locomotive standardization had been adopted by the railways of this country ten years ago it would now be possible to show, as I have shown, that there was such a great improvement between 1911 and 1917 in the design, equipment and operation of locomotives that the amount of freight handled with each locomotive was increased on the average 85 per cent.

Of all the changes which have occurred in the railroad business since it was my privilege to address your association before, the greatest, of course, are those which have been caused by the war in Europe and by the final entrance of our country into it. It is questionable if there is any class of American citizens engaged in industrial pursuits who have felt the effects of this war more than the railway officers.

It caused an enormous increase in railroad business in this country in 1916, the last year before we entered it. It caused a still greater increase in railway business in 1917, the first year that our country was in it. The organizations and facilities of the railways, after a long period

of restrictive regulation were inadequate to cope with this enormously augmented business. There is no part of the record which has been made by our country since we entered the war which affords more just ground for pride and gratification than the way in which the officers of the railways have risen to the demands of the occasion. During the first nine months that the United States was in the war the roads, in co-operation with the War Department, raised regiment after regiment of engineers to be sent to France, and they gave 70,000 of their officers and employees to the army, many of these going "over there" as members of these engineer regiments. Under the direction of the Railroads' War Board they handled a traffic which two years before it would have been inconceivable that they could have handled with the facilities at their disposal. Finally, there came the terrible winter of 1917-18. The weather experienced was the most severe ever known. One of the great trunk lines in the most congested eastern territory spent as much for removing ice and snow in that winter as it did in all the previous six winters combined. That simple fact strikingly illustrates the conditions with which the operating departments of the railways had to deal. Operating expenses were increasing so fast that they were rapidly wiping out earnings. The companies were confronted with demands from their employees for enormous increases in wages—demands many of which it was clear ought to be granted both as a matter of expediency and as a matter of justice. You know the sequel. The Government decided that it must step in and take control of railroad operation.

This development was regarded with alarm and regret by a very large majority of railway officers. They did not know how revolutionary the change would prove to be. They could not anticipate how it would affect them individually. What has been the attitude of railway officers toward Government control? It has been that of American citizens. They have put the welfare of their country above every other consideration. They said, in effect, at the start that whether it was right or wrong, wise or unwise, for the Government to take over the railways, now that it had done so they would loyally give it the best service of which they were capable in any place to which it might assign them. That has been their attitude ever since. It will be their attitude until the war is won.

List of Exhibitors

- Air Reduction Sales Company, New York.—Acetylene apparatus, oxygen and acetylene generator. Represented by R. T. Peabody, W. T. McCarthy and R. A. Sossong.
- American Arch Company, New York.—Represented by A. W. Clokey, R. J. Himmelright, John P. Neff and J. T. Anthony.
- American Flexible Bolt Company, Pittsburgh, Pa.—American staybolts, American hollow staybolt iron, American rivets, American marine staybolts. Represented by R. W. Benson, W. F. Heacock, J. A. Trainor, W. Widmeier, M. M. McCallister and C. A. Selye.
- Anchor Packing Company, Chicago.—Packings, nut lock for air stuffing boxes. Represented by J. C. Weedon and J. A. McNulty.
- Ashton Valve Company, Boston, Mass.—Wheel press recording gage, air and steam gages, safety valves. Represented by J. W. Motherwell, H. O. Fettinger and J. F. Getrist.
- Baldwin Locomotive Works, Philadelphia, Pa.—Photographs of locomotives. Represented by C. H. Peterson and C. H. Gaskill.
- Barco Manufacturing Company, Chicago.—Engine tender metallic connections for air, steam and feedwater between engine and tender; Barco metallic steam heat connections for passenger cars, coach yards, stations and roundhouses; Barco air reservoir connections; Barco automatic smokebox blower fitting; Barco loose bolt crosshead and slipper. Represented by F. N. Bard, C. L. Mellor, Charles Thomas and F. H. Stiles.
- Bird-Archer Company, New York.—Boiler chemicals. Represented by C. J. McGurn, R. P. Bird, C. A. Bird, J. A. McFarland, T. A. Peacock, C. C. Shaw, H. E. Wheeler and J. M. Dooley.
- Buda Company, The, Chicago.—Turbo-generator set, 500 watt capacity; headlight case and reflector. Both meet United States headlight requirements. Represented by M. A. Ross, J. W. Cleary and H. P. Bayley.
- Chambers Valve Company, New York.—Chambers throttle valve. Represented by Frank Clark, W. H. Bellmaine and E. Barnett.
- Commonwealth Supply Company, Richmond, Va.—Lewis power reverse gear. Represented by S. H. Lewis.
- Crane Company, Chicago.—Valves and fittings. Represented by Frank D. Fenn and Fred W. Venton.
- Dearborn Chemical Company, Chicago.—Represented by T. H. Price, O. H. Rheymerh, W. S. Reed, T. H. Ross, Paul Bowen, I. H. Bowen and I. L. Beebe.

- Detroit Lubricator Company, Detroit, Mich.—Lubricator.
- Flannery Bolt Company, Pittsburgh, Pa.—Tate flexible staybolt. Represented by W. M. Wilson, Charles Hyland and George Howard.
- Franklin Railway Supply Company, New York.—Franklin No. 8 firedoor, Franklin automatic adjustable wedge, radial buffer, engine and tender trucks. Represented by J. L. Randolph, C. W. F. Coffin, C. J. Burkholder and S. J. Rosenfelt.
- Galena Signal Oil Company, Franklin, Pa.—Represented by M. M. Meehan, D. L. Eubank, P. H. Stack, L. Gleason, J. A. Graham, F. J. Walsh, C. McNair, G. E. McVicar, L. H. Palmer, W. O. Taylor and A. J. Poole.
- Garlock Packing Company, Palmyra, N. Y.—Packing.
- Garratt-Callahan Company, Chicago.—Magic boiler preservative. Represented by E. V. Sackett, W. E. Rollinson, T. C. McCollum and A. H. Hawkinson.
- Gillespie & Co., A. W., Chicago, Ill.—Economy firebox door, Hendrickson journal bearing boring machine. Represented by A. W. Gillespie and J. S. Seeley.
- Hammett, H. G., Troy, N. Y.—Type D Trojan superheat metallic packing. Represented by E. C. Sawyer.
- Henry Manufacturing & Grease Cup Company, Terre Haute, Ind.—Henry locomotive grease cup. Represented by Miss Mildred Netherton and Harlow Varney.
- Hulson Grate Company, Keokuk, Iowa.—Hulson locomotive grate. Represented by A. W. Hulson and J. W. Hulson.
- Hunt-Spiller Manufacturing Company, Boston, Mass.—Cylinder bushings, cylinder packing, piston heads and bulb rings, valve bushings, valve packing, valve Tee rings, crosshead shoes, shoes and wedges, air pump bushings, side rod bushings. Represented by J. G. Platt, V. W. Ellet, E. J. Fuller, J. M. Monroe and C. F. Galloway.
- International Correspondence School, Scranton, Pa.
- Jerome Edwards Metallic Packing Company, Chicago, Ill.—Metallic packing.
- Johns-Manville Company, H. W., New York.—Power plant specialties, insulations, J-M expander rings, J-M brake cylinder packing cups, steam traps and slack take-ups. Represented by J. E. Meek, J. C. Younglove, G. Christenson, J. M. Barrowdale, P. C. Jacobs, C. E. Murphy, H. Flanagan, J. H. Trent, D. L. Jennings and E. H. Willard.
- Keystone Equipment Company, Philadelphia, Pa.—Wedge bolts. Represented by B. J. Shafer and E. J. Zust.
- Leslie Company, The, Lyndhurst, N. J.—Leslie steam heat regulators, Leslie electric headlight regulator and removable coupling nuts. Represented by S. Inglis Leslie and J. J. Cizels.
- Locomotive Feed Water Heater Company, New York.—Feed water heaters, boiler feed pump. Represented by E. A. Averill and H. V. Jones.
- Locomotive Lubricator Company, Chicago.—Locomotive force feed lubricators. Represented by W. J. Schlacks, O. H. Neal and C. W. Rudolph.
- Locomotive Pulverized Fuel Company, New York.—Represented by A. H. C. Dalley.
- Locomotive Stoker Company, Pittsburgh, Pa.—Photographs of shop equipment and cab view of the Duplex stoker, and photograph of Virginian Mallet No. 802. Represented by C. W. Allen, E. C. Haskins, J. J. Byrne, W. G. Clarke, O. B. Capps, W. S. Bartholomew, O. W. Detrick, J. J. Hanahan, C. E. Peterson, E. F. Milbank, E. Prouty and F. L. Wassel.
- Locomotive Superheater Company, New York.—Represented by George L. Bourne, F. A. Schaff, R. J. Van Meter, John Bell, William Boughton, W. A. Buckbee, George Fogg, A. C. Loudon, B. G. Lynch, S. Macdonald, A. C. McLachlan, J. E. Mourne, H. B. Oatley, R. M. Osterman, R. R. Porterfield, G. E. Ryder, G. E. Spengler, H. F. Spicer, K. E. Stillwell, W. G. Tawse and C. M. Wickham.
- Long, Jr., Company, Charles R., Chicago, and Louisville, Ky.—Railway paints. Represented by Charles R. Long, Jr., S. W. Russell, W. H. Heckman and G. S. Turner.
- Manning, Maxwell & Moore, Inc.—Exhibiting Ashcroft gages, Consolidated safety valves, Hancock inspirators, boiler checks and other appliances. Represented by C. L. Brown and F. J. Wilson.
- Metal Thermit Corporation.
- Nathan Manufacturing Company, New York.—Injectors, non-lifting; lubricators; boiler check; combined stop valve; gage cocks; power reverse 3-way valve; coal sprinkler; balance lever starting valve used in connection with injectors, water glass gages and cocks, globe and angle valves. (Government standard as applied to standardized locomotives.) Represented by W. E. Brumble, J. G. Arn, F. C. Davern, W. R. Walsh, Richard Welsh, H. L. Gettys and Herbert Ewan.
- National Malleable Castings Co., Cleveland, O.—The Sharon coupler.
- National Railway Devices Co., Chicago.—Shoemaker vertical firedoor. Represented by Jay G. Robinson and Milton M. Auerbach.
- Ohio Injector Company, Chicago.—Ohio injector, U. S. Government standard non-lifting injector, Chicago lubricator, Chicago flange oiler, Chicago automatic drifting valve and Chicago water glass protector. Represented by F. W. Edwards, W. S. Furry, Frank W. Furry and A. C. Beckwith.
- Okadee Company, Inc., Chicago.—Blow-off valves, hose-strainer, water glass protector. Represented by A. G. Hollingshead, G. S. Turner, Harry Vissering and W. H. Heckman.
- O'Malley-Beare Valve Company, Chicago.—Multiplate valves. Represented by Thomas O'Malley, Edward O'Malley, J. C. Brown, J. N. Gallagher, Walter Morris and G. A. MacLain.
- Paxton-Mitchell Company, Omaha, Neb.—Paxton-Mitchell metallic packing. Represented by Joseph L. Paxton and J. T. Suscombe.
- Perolin Railway Service Company, St. Louis, Mo.—Represented by R. P. Le Vake, Joseph Sinkler, Fred Wilcoxen and W. G. Newell.
- Pillioid Company, New York.—Sentinel low water alarm, Baker valve gear. Represented by R. H. Weatherly, Fred E. Pilliod, W. H. Bellmaine, Edward Barnett, J. J. Donovan and K. Eklund.
- Pocket List of Railroad Officials, New York.—Represented by C. L. Dinsmore.
- Pyle-National Company, Chicago.—K-23, E-2, E and M turbo-generators; also the standard and two special type incandescent headlight cases with accessories. Represented by J. Will Johnson, William Miller, L. H. Steger and F. Kersten.
- Railway Review, Chicago.—Represented by H. A. Smith, C. L. Bates, J. M. Lamadie and J. E. Gorion.
- Sargent Company, Chicago.—Sargent safety water gages, Soedige quick acting blower valve. Represented by George H. Sargent, P. W. Raymond and George S. Garren.
- Simmons-Boardman Publishing Company, New York.—Copies of *Railway Age* and *Railway Mechanical Engineer*. Represented by R. E. Thayer, A. F. Stuebing, L. B. Sherman and F. H. Thompson.
- Schroeder Electric Headlight & Generator Company, Evansville, Ind.—Standard U. S. turbo-generator, U. S. standard headlight case and reflector in operation, mounted interior set on ball bearings, parts and accessories. Represented by W. A. Carson, E. W. Jones, F. W. Edmonds and W. T. Manogue.
- United States Metallic Packing Company, Philadelphia, Pa.—Models of piston rod and valve stem packing. Represented by M. B. Brewster, Elliott Curtis, R. R. Wells, Harry Flynn, Harry Hyslop and L. B. Miller.
- United States Rubber Company.
- Vapor Car Heating Company, Chicago, Ill.—Steam hose coupler, reducing valve, hose clamps, stop valve, end train pipe valves, McLaughlin flexible steam joints. Represented by E. E. Smith.
- Vissering & Co., Inc., Harry, Chicago, Ill.—Viloco firedoor, locomotive sanders, piston and valve stem packing, bellringer. Represented by Harry Vissering, G. S. Turner and W. H. Heckman.
- Western Railway Equipment Company, St. Louis, Mo.—Lindstrom siphon. Represented by S. H. Campbell and R. L. Langtim.
- Westinghouse Air Brake Company, Pittsburgh, Pa.—Represented by C. J. Olmstead, A. K. Hohmyer, Lawrence Wilcox, L. M. Carlton, F. B. Farmer, J. A. O'Malley, V. Villette, F. W. Ainsworth, H. H. Burns and F. M. Nellis.
- White American Locomotive Sander Company, Roanoke, Va.—Graham-White Perfect sander. Represented by James Frantz and W. H. White.
- Wyoming Shovel Works, The, Wyoming, Pa.—Represented by G. E. Geer.



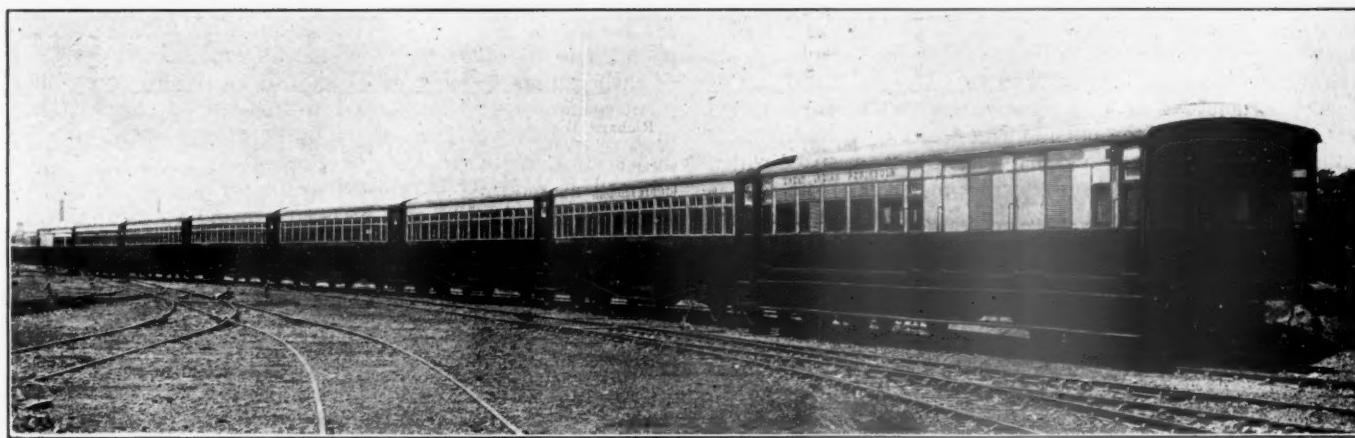
Copyright by Underwood & Underwood, N. Y.

190 mm. Railway Guns



Can. Off. Photo. Copyright by Underwood & Underwood, N. Y.

Is He Offering That Chew to the Whole Train Load?



The Great Indian Peninsula's Military Train

A Novel Scheme for Carrying Troops by Rail

The Great Indian Peninsula Railway of India Uses Military Cars, Holding 66 Soldiers Each

By Frederick C. Coleman

SINCE AN UNFORTUNATE mishap which occurred to troops in transit from the Northwest frontier of India some time back, most of the trooping arrangements have been conducted from the port of Bombay, and the Great Indian Peninsula Railway with commendable promptitude has now made most carefully planned and complete arrangements for safeguarding the comforts of the men entrusted to its charge.

To make the situation regarding the new troop trains quite clear it is necessary to refer to the general arrangements which have from time to time been made for military traffic in India. In "pre-mutiny" days, certain rivers and canals were the only means of transport, but with the advent of railways, the military authorities gradually utilized these, and troops were conveyed to their different cantonments "by rail" as this means of communication became established. It can be quite understood, however, that in such a large country as India, the journeys must be long even by rail and that to convey European troops through a country wherein the customs and habits of the inhabitants are so different is no easy undertaking. The government therefore instituted "rest camps" or large plain barracks at convenient intervals along the main lines of railway, to which the troops were conveyed in relays, that is to say, they would undertake their journeys in sections, resting one or two nights, as the circumstances might dictate, at the rest camps. As the speed of trains increased and refreshment and food arrangements became more organized this system of rest camps was more or less abandoned and the journeys attempted by through trains stopping at suitable intervals for meals. The trains themselves, however, were wanting in convenience and comfort for Europeans, inasmuch as they had to be made up of the standard third class cars of the country, which it may here be noted are very different from the third class cars used on English or American railways. If the class of car could be gaged by the rate of fare, the third class cars in India would be about 10th class in England, for the fare charged to an ordinary passenger amounts to the large sum of $\frac{1}{4}$ cent per mile.

The cars themselves are plain open vehicles with wood seats of slat pattern, and are built to accommodate about 100 third class passengers. When used for trooping this

number is considerably reduced, usually to two-thirds. It is as well to point out here that in India third class travel is of the "happy-go-lucky" style, for the passengers appear to prefer having double complement in the car to half. There then seems to be more voices to carry on the discussions, etc., which appear to go on continuously—the subject matter being "picer," or money—probably the amount of fare paid, etc. The noise in a third class car of an Indian Railway train at night is somewhat appalling; it is only on the mail trains where a slight extra fare is charged that the native passengers appear to want to sleep.

A soldier outward bound for India and traveling over the British railways from a country station to the port of embarkation is carried in a comfortable and well upholstered third class car and has little to complain of. On reaching India, however, (his arrival was usually timed for the "cold" weather, but recently, owing to war conditions, the journeys have had to be performed in the hot season), he was accommodated in the cars we have mentioned above. Some years ago, we believe, at the instance of the late Lord Kitchener, the authorities did have iron rails provided along the inside of the compartments of ordinary "thirds" on which hammocks could be slung, and so provide more sleeping accommodation for those men who previously had to lie on the floor.

This order of things has now been entirely changed, for to meet the problem of the better transportation of the British troops in India, the Great Indian Peninsula Railway, in collaboration with the military authorities, has recently completed at its Matunga workshops, Bombay, several special trains designed by A. M. Bell, the company's carriage and wagon superintendent, for the conveyance of troops coming and going to and from the various Indian cantonments. A complete train includes 11 cars: a staff car, a combination restaurant and sleeping car, a sleeping car for the officers, 6 military cars for the soldiers with a canteen car between and a brake van.

The military car is perhaps the most interesting. The body of the vehicle, 68 ft. long by 10 ft. wide, is built directly on a strongly braced steel underframe, the bottom sills of the sides being bolted to longitudinal angles running the full length of

the underframe sills. The side posts are braced by diagonals and the whole structure is pulled together with long tie bolts passing through from the plates to the sills. The framing of the superstructure is of Burmah teak, sheathed with planished steel panel plate on the outside and lined with teak on the inside. Between these two skins there is a 2 in. space which is divided by a layer of heat-resisting material. The roof is treated in a similar manner which represents the standard practice for all of the new passenger cars built for the Great Indian Peninsula since the old "sunshade" arrangement was discarded. The cars are each of the corridor type with end

are stowed below the lowest berths, and their kits are accommodated in parcel racks above the uppermost. At each end of each car are two lavatories and also a wash-basin with a plentiful water supply. About two tons of water are carried in galvanized cylindrical steel tanks placed below the car underframe, the supply for the high-level tanks, etc., being pumped as required by semi-rotary hand pumps. The provision of this facility was necessary owing to the difficulty of obtaining an adequate water supply at intermediate stations on certain stretches of railway.

The trains when made up accommodate half a regiment

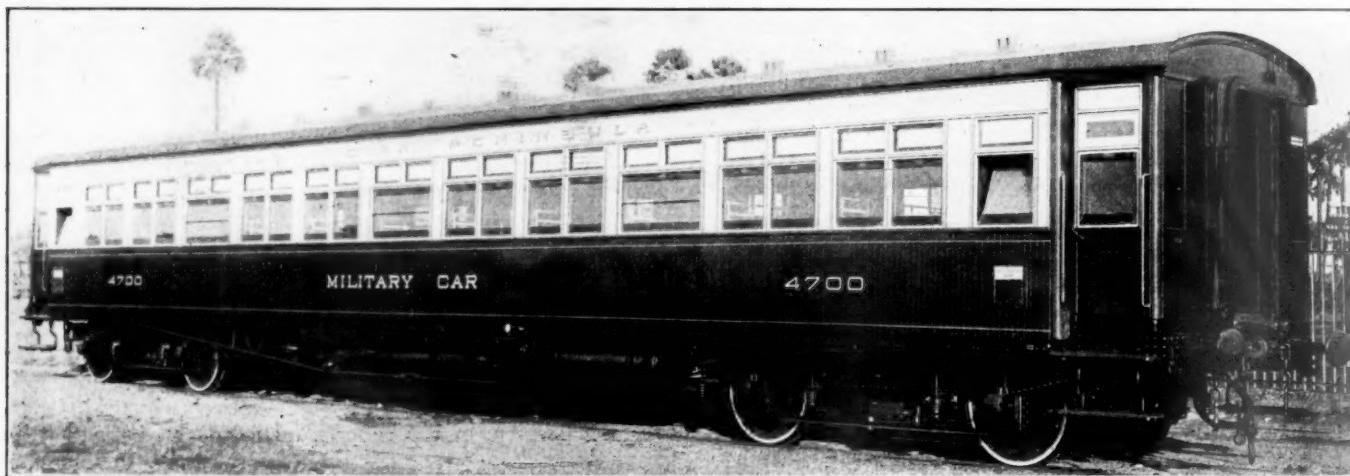


Kitchen Car of the Military Train

doors and vestibules built according to standard dimensions. To secure a maximum cross section with the utmost permissible height, without departing from the standard 3-ft. 7-in. diameter wheels, the floor has been brought down onto the underframe. The interior therefore measures from floor to roof 8 ft. 5 in.

The internal arrangements of the military cars consist of galvanized steel tubular framing which supports the berths in tiers of three, a total of 66 being provided in each car, with berths 7 ft. long, one above the other. This arrangement is somewhat similar to that adopted on a troopship. In the hot season only 44 soldiers are usually carried in this

with complete kit and equipment, carry rations for the entire journey, the only stops made en route being those for traffic and locomotive purposes. Incandescent gas lamps are used for lighting the interior. For ventilating, a double row of "Monarch" exhausters are placed "hit and miss" along the roof, and above the windows there are openings which can be closed with either venetians or shutters. This combination permits of the inlet of a steady current of air from the outside, through the interior, and out by the roof. The officers are accommodated in a corridor sleeping car connected to a composite sleeper and restaurant, while the stores, mineral waters, ice, etc., are carried in the end vans. The



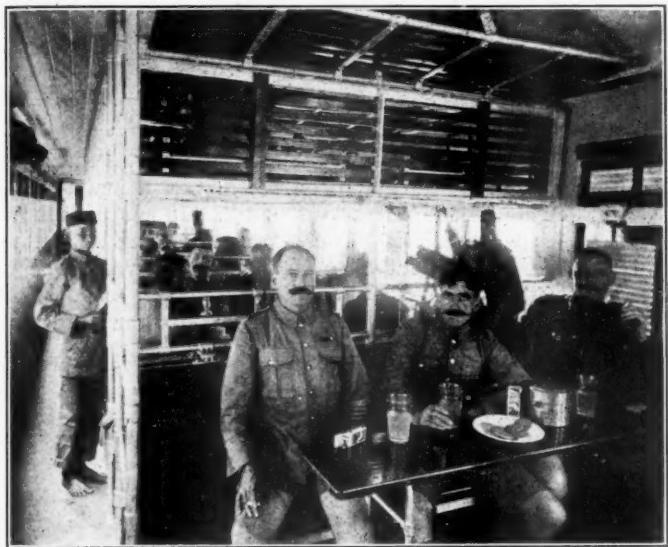
The Military Car

manner, as the upper berths are left vacant. Typical views of one of these cars, as used for day and for night travelling, are shown in the illustrations. The lowest berth forms a seat by day, while the middle one folds down to form a back for it, and the uppermost folds up against the parcel rack. There are no partitions to form compartments, but the berths—being arranged transversely and opening off the side corridor—give similar effect, with the added advantage that the tubular framing and the open slats of the berths give to the car an open and well ventilated interior. The men's rifles

crew or staff attending upon the wants of the soldiers is also accommodated in these. At meal times portable tables are placed between each set of seats in the military cars and the meals are served from the kitchen by orderlies appointed for this work.

The kitchen car is of the same over-all dimensions as the other vehicles forming these military trains. It has a large central kitchen with tiled sides and floors with a large cooking range situated in a central position. This range is operated with oil burnt in vaporizing burners at each end of its

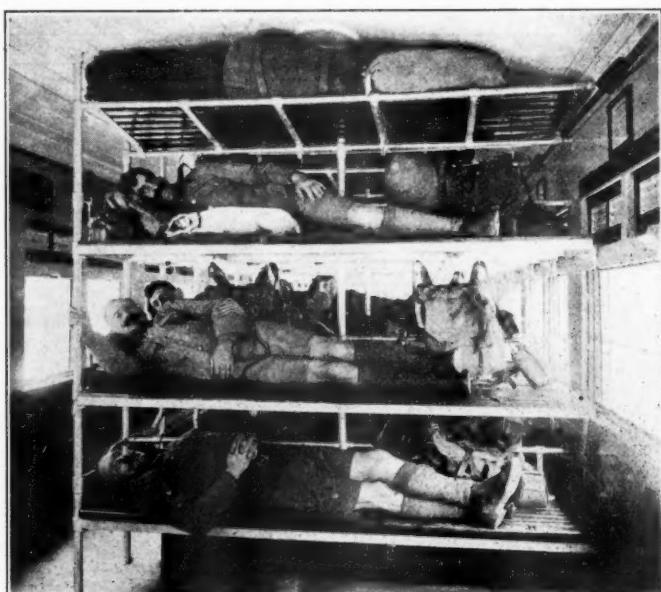
casing. All the usual kitchen arrangements are incorporated in this apartment. Adjacent is a cold storage for meat, etc., and a compartment from which iced drinks, tea, coffee, etc., are served. At the opposite end of the kitchen car are quarters for the sergeant-in-charge, cooks, attendants, etc.



The Military Car by Day

A plentiful supply of water is carried in tanks underneath, and electric ventilators are provided in the roof, operated from the lighting system of the car.

A train made up in this manner is 730 ft. in length and weighs approximately 400 tons, and the running time allowed averages 30 miles per hour, without stops. It has



The Car Arranged for Night Travel

thus been possible to reduce considerably the time of transport of troops over many of the long runs between the military depots in India, as no "rest halts" are required, and as the kitchen car carries the necessary commissariat arrangements, the only intermediate stops necessary are those required for locomotive and train purposes.

NEW BERLIN-VIENNA RAILWAY.—Construction of a fourth direct railway from Berlin to Vienna is said to have been approved by the German Railway Control Board.

Train Accidents in June.¹

THE FOLLOWING is a list of the principal train accidents reported as occurring on the railroads of the United States in the month of June, 1918:

Date	Road	Place	Kind of Accident	Collisions	
				Train	Kil'd
3.	Atchison, T. & S. F.	Acomita.	bc	P. & P.	0 13
4.	Erie	Rittman.	bc	F. & F.	6 3
5.	Central Vermont	Burlington.	bc	P. & F.	9 7
14.	Lack. & W. V.	Moosic.	rc	F. & F.	2 9
*22.	Mich. Central	Ivanhoe.	rc	F. & P.	79 120

Date	Road	Place	Cause of Derailment	Derailments	
				Train	Kil'd
3.	Missouri Pac.	Hope, Ark.	malice	P.	2 91
9.	New York, N. H. & H.	Lakeville.	acc. obst.	P.	.. ..
9.	Louisville & N.	Huber, Ky.	.....	P.	0 16
12.	Southern	Amherst.	.....	P.	1 1
*12.	Denver & R. G.	Salt Lake.	d track	P.	1 12
*13.	Lehigh V.	Bear Creek J.	b. wheel	F.	0 0
17.	Missouri K. & T.	.....	d. bridge	P.	0 9
18.	St. Louis S. W.	Selby, Tex.	.....	P.	0 36
21.	Pennsylvania	Hastings.	ms.	P.	0 3
23.	K. C. Mex. & Orient.	Woodland.	d. journal	F.	1 0

Date	Road	Place	Cause of Accident	Other Accidents	
				Train	Kil'd
23.	N. Y. N. H. & H.	Saybrook J.	b. pipe	P.	0 20

The trains in collision at Acomita, N. M., on the third were westbound passenger No. 7 and eastbound passenger No. 2. The westbound train was standing at the station and was struck by the eastbound at about 20 miles an hour; both locomotives were wrecked. One engineer, one fireman, two express-baggage men and one porter, five passengers and three others were injured. The engineman of train No. 2 had overlooked the fact that the right of his train to main line at the meeting point had been taken from him by train order.

The trains in collision near Rittman, Ohio, on the 4th, were, westbound train consisting of a locomotive and empty passenger cars, and an eastbound locomotive, running backward, without cars. Six men were killed and three were injured. The killed were all on the westbound train, the engineman, the fireman, the conductor, two brakemen and a porter. The men on the eastbound locomotive had seen their danger in season to jump off, and they were injured, but not fatally. The westbound train was running on the eastbound track.

The trains in collision near Burlington, Vt., on the fifth, were a southbound mixed train, not carrying passengers, and a northbound locomotive, belonging to a worktrain, but running without cars. The collision occurred in a short tunnel, and both locomotives were wrecked. Nine employees were killed and seven were injured. The exact cause of the collision is not definitely known as most of the employees concerned were killed; but dependence on insufficient flagging is believed to have been the primary cause.

The trains in collision on the Lackawanna & Wyoming Valley at Moosic, Pa., on the 14th, were a worktrain, just starting out of a side track, and a northbound freight, the freight striking the rear end of the worktrain. Two employees were killed and nine were injured. The flagman of the worktrain had put down torpedoes and had returned to his train; but the torpedoes were not far enough back, and the freight had not time in which to stop.

The trains in collision on the Michigan Central at Ivanhoe, Ind., on the 22nd were a mixed train, westbound, carrying a part of a circus, and a following extra train consisting of empty sleeping cars. Four sleeping cars and a caboose at the rear of the circus train were wrecked and took fire, and

¹Abbreviations and marks used in Accident List:
rc, Rear collision—bc, Butting collision—xc, Other collisions—b,
Broken—d, Defective—unf, Unforeseen obstruction—unx, Unex-
plained—derail, Open derailing switch—ms, Misplaced switch—acc.
obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—
boiler, Explosion of locomotive on road—fire, Cars burned while run-
ning—P. or Pass., Passenger train—F. or Ft., Freight train (including
empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly
destroyed by fire—Dagger, One or more passengers killed.

78 passengers and one employee were killed, and 120 passengers injured. The employee killed was the trainmaster. The train of empty cars had run past distant and home automatic signals set against it and had also been warned by a fusee, the line of road being straight. The collision occurred at 3:57 a. m. This collision was reported in the *Railway Age* of June 28, page 1570.

The train derailed near Hope, Ark., on the third was the northbound Sunshine Special. The locomotive was thrown off the track and overturned at a switch which had been maliciously tampered with. Two trainmen were killed, and 79 passengers and 12 employees were injured, none seriously, it is said.

The train involved in the accident at Lakeville, Mass., on the ninth about 6 a. m., was a westbound passenger. The train struck an automobile at a highway crossing and one car was thrown off the track. No persons on the train were injured, but in the automobile five men were killed and two were injured.

The train derailed at Huber, Ky., on the ninth, was southbound passenger No. 7, the same train which was involved in a collision, within about three miles of Huber, last December. The train was derailed while running at full speed, and two coaches were dragged some distance on their sides. The engine and one car remained on the track. Sixteen passengers were injured.

The train derailed at Amherst, Va., on the 12th, was northbound passenger No. 32. The train struck a freight car which fouled the main track and the locomotive and four cars were overturned. The fireman was killed and the engineman was injured.

The train derailed at Salt Lake City, Utah, on the 12th, was a westbound passenger. The train was running at a speed of about fifty miles an hour; three coaches were derailed and partly turned over, two fell down a bank, one tourist and two standard Pullmans derailed; one passenger was killed and twelve injured. The derailment is believed to have been due to distortion of track by solar heat.

The train derailed at Bear Creek Junction, Pa., on the 13th, was an eastbound freight, in which were 42 tank cars filled with gasoline. The wreck took fire, presumably from friction of iron parts, and 17 cars of gasoline were burnt up. The derailment was caused by a broken wheel.

The derailment on the Missouri, Kansas & Texas on the 17th was between Dallas and Wichita Falls. Six passengers and three trainmen were injured. The derailment was caused by the failure of a bridge weakened by fire.

The train derailed on the St. Louis Southwestern near Selby, Tex., on the 18th, was a southbound special, carrying soldiers. The engineman, fireman, and five soldiers were injured seriously, and 29 other soldiers escaped with less severe injuries.

The train derailed at Hastings, Pa., on the 21st, was a local passenger, from Garway to Hastings. The engine was thrown off the track at a misplaced switch and, with two cars, was badly damaged. Two passengers and one trainman were injured.

The train derailed near Wooland, Tex., on the 23rd, was westbound freight No. 19. One brakeman was killed. The cause of the derailment was the failure of a journal which had become heated.

The train involved in the accident at Saybrook Junction, Conn., on the evening of the 23rd, was eastbound passenger No. 26. As the train approached the station, at moderate speed, the windows of four coaches were broken by a blast of air or steam from the locomotive of a westbound train, passing at the moment, due to the breaking of a connection to the air pump. Twelve passengers were injured by glass.

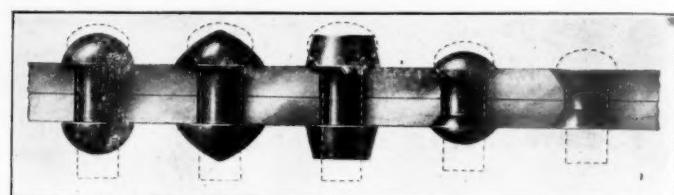
Electric Car Accidents—Serious accidents to electric cars were reported in June at four places: New York City on the 1st; East Brighton, Ala., on the 11th; Newark, N. J., on the

21st; and Angola, N. Y., on the 29th. Of the numerous personal injuries, none were reported fatal.

Canada—An express train was derailed on the Canadian Pacific at Shepard, Alta., on the 19th and one on the Canadian Government Railway at Nash's Creek, N. B., on the 27th. In the first mentioned nine persons were reported injured and in the other none.

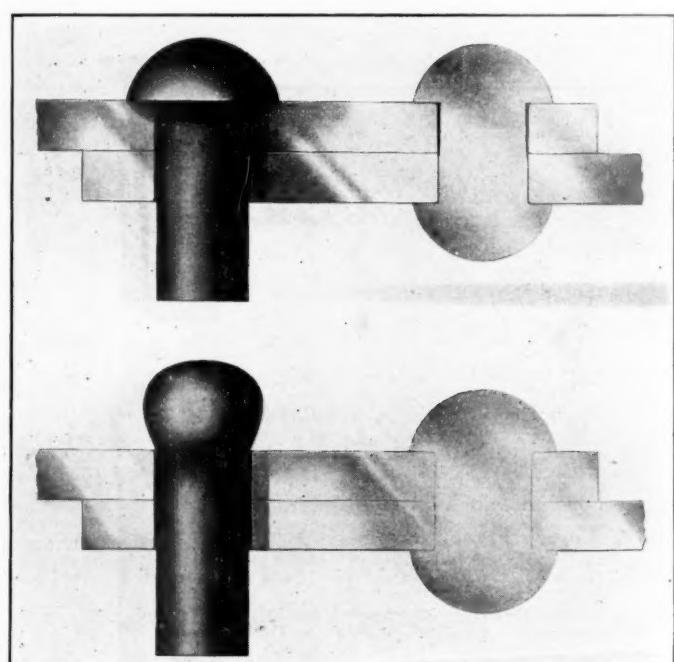
Tight Rivets

THE AMERICAN FLEXIBLE BOLT COMPANY, Pittsburgh, Pa., has recently placed on the market a new type of rivet called the "American" rivet. It has a rounded head, which when driven into the work will more completely fill the rivet hole than the ordinary type of rivet. One of the illustrations shows actual photographs of sections cut through riveted plates, in which both the ordinary



Various Types of Heads Can Be Formed from the One Head of the "American" Rivet

type of rivet and the "American" rivet were used. With the ordinary type of rivet it is practically impossible to upset the metal directly under the head on account of the square shoulder. With the "American" rivet the metal is made to flow under the head and fill the rivet hole as the head is upset in the process of riveting. By thus



Sections Through Plates Riveted by the Ordinary Type of Rivet and the "American" Rivet Showing How the "American" Rivet Completely Fills the Rivet Hole

filling the rivet holes more perfectly, the "American" rivet requires less calking and less stock is required to form the different types of heads. No sharp corners are formed in its manufacture to weaken it. Any desired shape of head may be obtained from the one stock pattern.

Doings of the United States Railroad Administration

Rules for Adjustment of Labor Controversies Issued— Table d'Hoté Meals in Dining Cars Ordered

Adjustment of Labor Controversies

W. S. CARTER, director of the Division of Labor, has issued a circular regarding methods of adjusting differences as regarding labor, in part as follows:

In the adjustment of differences of opinion, not involving rates or amount of wages, or hours, that arise in the relations between the officials and employees, which differences are to be expected, sincere effort should be made to reach a common understanding without the necessity of reference to the director general, or to the Division of Labor. Where such controversies are not so adjusted, or where questions involving rates or amount of wages or hours are raised, the following methods will be adopted:

(a) Requests by employees for increases in wages, in addition to increases provided for in wage orders, will be filed *only* with the Board of Railroad Wages and Working Conditions, to which board has been assigned the duty of hearing, and investigating such matters, as provided in Article VII of General Order No. 27.

(b) The method of securing interpretation of wage orders is prescribed by the director general in Supplement No. 6 to General Order No. 27, and the prescribed method should be followed in cases involving interpretations of wage orders.

(c) When employees are represented by railway boards of adjustment, the procedure as to all controversies within the scope of their duties will be as directed in general orders creating such boards. The fact that certain employees are not represented by railway boards of adjustment will in no manner deprive them of any of the benefits accruing from such boards. An assistant to the director of the Division of Labor has been appointed, and a staff of representatives has been organized, for the especial purpose of rendering the same service to such employees as though represented by a railway board of adjustment. Boards of adjustment have been created by understanding with the larger organizations of employees, for the convenience of handling such matters and to relieve the director of the Division of Labor of adjusting same. It is not practicable to create railway boards of adjustment, except for the larger organizations of employees.

(d) Requests for adjustments in wages by employees *not* represented by railway boards of adjustment, which requests are based upon existing practices or adjustments reached through former arbitrations and settlements, will be presented to the proper officials of the railroads, and negotiations will be conducted in the usual manner up to the chief operating officer, or officer designated by him. Should no agreement be reached, and it appear to be necessary to take the matter further, a joint statement of facts (in duplicate) will be prepared by the representatives of the employees concerned and the proper officials of the railroad, and submitted to the director of the Division of Labor of the United States Railroad Administration. Attached to such joint statement of facts will be such brief arguments by both parties to the controversy as is believed desirable by those concerned. When an adjustment is not then reached through correspondence, a representative will be assigned to investigate, and if by his assistance no agreement is then reached, the matter in controversy will be referred again to the director of the Division of Labor.

(e) Personal grievances or controversies arising under interpretation of wage agreements, and all other disputes arising between officials of a railroad and its employees *not*

WASHINGTON, D. C.,

represented by railway boards of adjustment, will be handled in the usual manner by the individual, his representative, or by committees of employees, up to and including the chief operating officer of the railroad, or officer designated by him, when, if an agreement is not reached, the chairman of the committee of employees and the officer of the railroad will refer the matter to the director of the Division of Labor, in the same manner as provided in Paragraph *d* of this circular.

(f) When an employee, or class of employees, is not represented by committees, and negotiations can not be conducted in the usual manner, matters of complaint will be taken up with the proper officials of the railroad. When such employee or employees desire to appeal to the director general, a complete statement of the cause of complaint will be filed by such employee or employees with the director of the Division of Labor. When an adjustment is not reached through correspondence, a representative will be assigned to investigate, and if by his assistance no agreement is then reached, the matter in controversy will be referred again to the director of the Division of Labor.

(g) General Order No. 8 suspended negotiations for revision of schedules or general changes in conditions affecting wages and hours pending decision of the matter by the director general, which was accomplished by General Order No. 27. No order has since been issued either prohibiting or directing that negotiations for revisions of working conditions be undertaken. This matter is left to follow the usual course, except that all requests for increases in wages, reduction of hours, or special rates for overtime will be taken up directly with the Board of Railroad Wages and Working Conditions. Where working conditions are not agreed upon by committees of employees and the officials of the railroads, a joint statement of the points at issue will be prepared and filed with the director of the Division of Labor, attaching thereto such brief arguments as may be desired. When an adjustment is not then reached through correspondence a representative will be assigned to investigate, and if by his assistance no agreement is then reached, the matter in controversy will be referred again to the director of the Division of Labor.

Nothing herein contained has reference to employees of railroads not under federal control.

Garnishment of Wages Prohibited

General Order No. 43, issued on September 5, provides as follows:

"Whereas proceedings in garnishment, attachment, or like process by which it is sought to subject or attach money or property under federal control or derived from the operation of carriers under federal control under the act of Congress of March 21, 1918, are inconsistent with said act, and with the economical and efficient administration of federal control thereunder; and

"Whereas such proceedings are frequently commenced, particularly for the garnishment or attachment of amounts payable, or claimed to be payable, as wages or salaries of employees, which practice is prejudicial to the interests of the Railroad Administration in the operation of the lines and systems of transportation under federal control, and is not necessary for the protection of the rights or the just interests of employees or others; and

"Whereas if any rules or regulations become necessary to

require employees to provide for their just debts, the same will be issued hereafter;

"It is therefore ordered that no moneys or other property under federal control or derived from the operation of carriers while under federal control shall be subject to garnishment, attachment, or like process in the hands of such carriers or any of them, or in the hands of any employee or officer of the United States Railroad Administration."

Table d'Hoté Meals in Dining Cars

The Railroad Administration has been turning some of its efforts toward an improvement and some degree of stand-

Works	For week August 1 to 3			For week August 4 to 10			For week August 11 to 17			For week August 18 to 24			For week August 25 to 31			
	Road	No.	Type	Road	No.	Type	Road	No.	Type	Road	No.	Type	Road	No.	Type	
American	D.L.&W...	1	Mikado	N.&W.	8	Mallet	D.&H.	10	Consol.	D.&H.	6	Consol.	W.&L.E....	1	USRA Mik.	
	N.&W.	2	Mallet	Va.	1	Mallet	P.L.W....	1	Santa Fe	Me.C.	2	Switch	D.&H.	4	Consol.	
	I.C.	3	Switch	I.C.	3	Switch	W.&L.E....	1	USRA Mik.	W.&L.E....	8	USRA Mik.	G.B.&W....	2	Mogul	
	Sou.	4	Santa Fe	Sou.	3	Santa Fe	I.C.	3	Switcher	I.C.	3	Switcher	C.&E.I....	4	USRA Mik.	
	N.P.	4	Mikado	N.P.	2	Mikado	Sou.	1	Santa Fe	Me.C.	2	Switcher	C.N.J....	10	USRA Mik.	
		14			17			16					III.C.	3	Switcher	
	L.C.	1	Switch	B.&O.	4	USRA Mik.	Sou.	1	Santa Fe	C.N.J.	1	Pacific	A.T.&S.F....	3	Mikado	
	P.&O.	5	USRA Mik.	C.N.J.	1	Pacific	B.&O.	2	USRA Mik.	C.O.	6	USRA Mik.	U.P.	3	Mikado	
	A.T.S.F....	2	Mikado	P.&R.	1	Mallet	C.O.	4	USRA Mik.	B.&O.	4	USRA Mik.	G.N.	3	Switcher	
				S.P.	2	Switcher	P.R.R.	2	Mikado	P.R.R.	2	Mikado	E.&O.	7	USRA Mik.	
Baldwin	A.C.L.	1	Pacific	P.&R.	1	Consol.	P.R.R.	1	Consol.	P.&R.	1	Consol.	C.N.J.	1	Pacific	
	G.N.	3	Mikado	I.C.	2	Mikado	S.L.-S.F....	2	Santa Fe	I.C.	2	Santa Fe	I.C.	1	Mikado	
	G.N.	1	Switcher	G.N.	2	Switcher	S.P.	2	Switcher	S.P.	2	Switcher	C.B.&Q.	1	Mikado	
	A.T.&S.F....	1	Mikado	C.B.&Q.	2	Mikado	I.C.	2	Mikado	I.C.	2	Mikado	P.R.R.	1	Mikado	
	U.P.	2	Mikado				G.N.	2	Mikado	G.N.	2	Mikado	A.T.&S.F....	1	Consol.	
		8			16			16					25		21	
	Iima....	N.Y.C.	3	Mohawk	N.Y.C.	6	Mohawk	N.Y.C.	6	Mohawk	N.Y.C.	5	Mohawk	N.Y.C.	5	Mohawk
	Total.....		25		39			38				49		52		

ardization of dining car service. Director General McAdoo has announced that, effective October 1, the custom of serving a la carte meals on dining cars will be abandoned so far as lunch and dinner are concerned and the table d'hoté plan will be substituted. Breakfast will consist of a simple a la carte menu at moderate prices and lunch and dinner will be table d'hoté meals of not to exceed four courses. The charge for lunch and dinner will be \$1 with the exception that on a very few limited trains the charge for dinner will be \$1.25.

While in a general way the plan contemplates a standardization of meals, there will be such variation as local market conditions make desirable. The meals, it is stated, while simple, will be both ample and good, and the "small charge, which will bring them within the reach of the most moderate purse," is made possible by the many evident economies that can be accomplished, such as the increased capacity of dining cars, the complete utilization of supplies and the saving in skilled cooks and waiters who are very difficult to engage at present. Patrons will be saved the delays incident to the selection from varied menus and the inconvenience produced by congested conditions of travel. The new plan is also expected to result in the conservation of food.

Arrangements have been completed for making the new plan effective on the same day on all railroads under government control. At the same time steps are being taken looking to the co-ordination of dining car organizations and commissaries and the joint utilization of equipment which it is thought will lead to far more satisfactory results, both for the railroads and the public, than was possible under the old conditions.

New Freight Cars in Quantity Production

Quantity production of some of the types of the standard freight cars ordered by the Railroad Administration has been attained and instructions have been sent to the car manufacturers as to which roads should receive the first deliveries. In the case of box cars they are naturally being sent first to the western roads that need them for the grain movement.

The American Car & Foundry Company has been making regular deliveries of the double sheath box cars since September 1 and more recently of hopper cars. The Haskell & Barker Car Company is also turning out gondolas and the Standard Steel Car Company hopper cars. By the first of the week it was stated that cars were being turned out at the rate of over 100 a day.

203 New Locomotives Delivered in August

Director General McAdoo on September 6 authorized the following statement of new locomotives delivered to railroads during the month of August:

Of the total of 203 locomotives, 56 were on account of the orders placed by the Railroad Administration and 147 were on previous orders.

Insurance and Fire Protection

Circular No. 54 issued by the director general announced that in supervising the work of the Insurance and Fire Protection Section John Skelton Williams will be assisted by Theodore H. Price, actuary to the Railroad Administration. In the work devolving upon it the section will have the co-operation of an advisory committee of which Mr. Price is chairman. The other members of the committee are R. M. Bissell, (president of the Hartford Fire Insurance Co., Hartford, Conn., and also chairman of the National Conservation Committee and the National Board of Fire Underwriters); Charles E. Mather of Philadelphia; D. R. McLennan, of Chicago, and A. M. Schoen, a civil and electrical fire protection engineer and expert, at present chief engineer of the Southeastern Underwriters' Association of Atlanta, Ga.

The section will have its own force of general inspectors and loss investigators, reporting directly to it at Washington, and through the Division of Operation will communicate to the regional directors and the officers and employees of the operating force under them with regard to the work of fire prevention and inspection on all railways under control of the Railroad Administration, with the object of utilizing existing organizations as they may be available, reorganizing them when it may be necessary, and establishing adequate fire protection and inspection organizations for those properties upon which no such organization is now maintained.

The circular says it is believed that if every employee can be made to feel an alert consciousness of responsibility for this loss, that it can be substantially reduced, thus effecting an important saving in the cost of operation and avoiding the interference with and delay of traffic that fires cause. To this end the earnest co-operation of every employee of

the United States Railroad Administration is desired and requested.

Service on Mississippi and Warrior Rivers

Director General McAdoo has given his approval of plans for establishing transportation service on the Mississippi and Warrior rivers under the direction of the Division of Inland Waterways. A fleet of 30 steel barges and seven tow-boats has been assigned for operation on the lower Mississippi and weekly sailings will be established beginning the last week in September between St. Louis and New Orleans, for both bulk and package freight. The fleet will have a carrying capacity of 6,000,000 ton-miles per week and the service will be augmented as soon as additional equipment is available, forming a substantial addition to the transportation facilities of the middle west. It has been found necessary to make the establishment of proper and adequate terminal facilities a condition precedent to the inauguration of service at intermediate points.

For service on the Warrior river steel self-propelled barges originally designed by the Alabama & New Orleans Transportation Company for the coal trade have been purchased, together with other equipment sufficient to carry 300,000 tons of coal annually from the mines on the Warrior river to Mobile and New Orleans. The Lake Borgne Canal has also been leased, giving a short route to New Orleans harbor from Mobile Bay. The temporary fleet is now being repaired and plans are being laid to obtain steel equipment sufficient to carry 1,500,000 tons annually by water to the gulf.

Rates on Live Stock Feed

At the present time there are no commodity rates applying on velvet beans, meal, cake, etc., from Memphis, Tenn., to points in Arkansas, Louisiana and Oklahoma. In order to encourage the movement of these commodities there has been authorized the establishment from Memphis to all points in Arkansas, Oklahoma and points in Louisiana (west of the Mississippi river) the same rates as now apply on cotton seed meal, subject to minimum carload weight of 40,000 lb. On account of the increased necessity for stock feed and the scarcity of cotton seed meal, a demand has been created at points in the Southwest for velvet beans, velvet bean meal, velvet bean cake, copra meal and soya bean meal. These commodities are used as live stock feed the same as cotton seed meal. Live stock feeders in the states of Oklahoma, Arkansas and Louisiana, West of the Mississippi river, who have heretofore used cotton seed meal for feeding purposes, owing to the shortage of cotton seed meal must now seek some other feed. Shippers at Memphis, Tenn., advise that they are able to take care of the situation by supplying velvet beans, velvet bean meal, velvet bean cake, copra meal and soya bean meal, which commodities make good substitutes for cotton seed meal for feeding purposes.

Improper Packing Being Checked

In the effort to improve the general handling of less than carload shipments and to reduce the amount of loss and damage claims, particular attention has been directed to the feature of improper packing, resulting in more rigid inspection of packages, before accepting for shipment.

Reports from one middle West district indicate that during the period of four months just ending, a total of 27,541 small shipments were turned down by the receiving clerks, 14,570 of these shipments were repaired or recovered, and were accepted by the railroads for shipment. 12,971 of the shipments, however, were rejected entirely by the railroads. This, of course, means that consignees received their goods in better condition, and undoubtedly also means a big saving to the railroads in avoiding numerous claims for loss

and damage which would have accrued had the shipments been accepted as originally presented.

Particular attention is being given to this matter of less than carload shipments, and many thousands of car miles are being saved daily by the elimination of duplicate or unnecessary package cars.

Estimates of Additions and Betterments for 1919 Called For

In order to determine what additions and betterments, including equipment, and what road extensions should be made during the year 1919, the Division of Capital Expenditures, in D. C. E. Circular No. 10, is asking federal and general managers to have prepared at once budgets setting forth briefly each project which in their judgment should be commenced on D. C. E. Form 9. Regional directors are expected to issue instructions in accordance with the circular and to give such directions and supervision to the preparation of the budgets for submission to them as they may deem advisable. The regional directors are to note on the forms the elimination of any project or jobs which they disapprove, with comment as to their reasons, and to send the revised budgets to the Director of the Division of Capital Expenditures. It is not the intention that the budgets as submitted shall be approved, but they are to be prepared solely for the purpose of affording an approximate forecast of the work considered necessary for 1919 and its approximate cost.

Rules for Investigation of New Devices

The circular of rules governing the submission of devices or inventions to the Railroad Administration, issued by the mechanical department of the Division of Operation and published in last week's issue, has been reissued by the Division of Operation as Circular No. 18 in practically the same form but made to apply to appliances for roadway or track as well as for use on cars and locomotives. Correspondence regarding matters of this nature which relate to locomotives or cars should be addressed to Frank McManamy, assistant director, division of Operation, and correspondence relating to appliances in connection with roadway and track should be addressed to C. A. Morse, assistant director, engineering and maintenance.

Re-Routing Saves Car Miles

The Railroad Administration has issued a statement saying it is following up closely the question of eliminating circuitous routing, and is meeting with close co-operation on the part of shippers generally. Several months ago arrangements were made to check billing at the more important junction points, change routing and send cars via direct routes, calling attention of the initial lines and shippers to roundabout routing. A report shows that during a recent month three Wisconsin junctions re-routed 1221 cars, with a saving of 93,750 car miles. The real transportation economy in this, however, is in the fact that all these cars were originally routed through Chicago, and were diverted to other junctions, thereby avoiding handling through the Chicago terminals.

Fruit Movement

Director General McAdoo has announced that a report from Hale Holden, regional director of the Central Western region, for the month of August shows that during that month 138 special fruit trains, with 5640 cars, were operated through from California to the Missouri river and Chicago. The total California movement since the commencement of the season about June 1 amounted to 446 trains, with 17,495 cars. The Colorado fruit movement commenced about August 15, and during the latter portion of the month there were moved a total of 45 fruit specials, with 1523 cars.

I. C. C. Certifying Standard Return for Compensation Contracts

The Interstate Commerce Commission is now furnishing the director general daily with certifications of the amount of the "Standard return," as provided in the railroad control act, representing the average net operating income of the various railroads for the three years ending June 30, 1917, which is to be inserted in the standard contracts with the individual roads to represent the amount of their compensation. Although the law makes the three-year average the maximum this figure is being used in the ordinary case.

Chief of Secret Service Appointed

Effective September 18, William J. Flynn, former chief of the secret service division of the Treasury Department, has been appointed chief of the secret service of the United States Railroad Administration in the Section of Claims and Property Protection, with offices in the Southern Railway building, Washington, D. C.

* * *

H. S. Noble has been appointed federal manager of New York and New Jersey canals to succeed G. A. Tomlinson who was appointed director of the Division of Inland Waterways of the Railroad Administration as noted in last week's issue of the *Railway Age*.

Fuel Conservation at Stationary Plants

AN ENTHUSIASTIC MEETING of railway men directly responsible for the consumption of fuel in the stationary plants on the railways under the control of the Railroad Administration was held at the Fort Dearborn Hotel, Chicago, September 9, under the direction of Eugene McAuliffe, manager, Fuel Conservation Section. The meeting was well attended and inspiring impromptu talks were given by representatives of the Fuel Administration, the Fuel Conservation Section of the Railroad Administration and railroad men.

Mr. McAuliffe in opening the meeting called attention to the great amount of fuel that will be required for the railways this year. At the best possible estimate this will amount to 166,000,000 tons, of which 16,000,000 tons will be used in other than locomotive fireboxes. This coal will cost on an average \$3.50 per ton which is 250 per cent greater than the average price in 1915. While from a purely financial standpoint all possible saving in fuel should be made, the most important reason is its scarcity. It is estimated that the country will be short 75,000,000 tons and the railways, the largest consumers of fuel, must contribute a large amount to make up this shortage. Although much has already been accomplished in using fuel economically on locomotives there is practically a virgin field among the railway stationary plants. While no attempt was made by Mr. McAuliffe to go into detail regarding the manner in which fuel can be saved in these plants he called attention to the great importance of keeping steam pipes and boilers well lagged to prevent undue radiation of the heat. Particular attention was also called to the importance of preventing all kinds of leaks. Piping extending for any great distance should have ample provision for expansion. Exhaust steam should be used for heating wherever possible. The buildings should be kept tight in winter so the heat will not be wasted.

Fuel must be conserved. The shortage of fuel in England has required that country to take 8,600 men from the army to mine more coal. Coal should be salvaged the same as scrap. At the present prices five tons of coal is worth

one ton of ordinary scrap. One road adds a coal car to the work train that is sent over the line to pick up the scrap for the purpose of collecting the waste coal with the scrap.

Talks by Fuel Administration Representatives

David Moffet Myers, advisory engineer, United States Fuel Administration, spoke of the work the Fuel Administration is doing; described its organization and offered freely the services of the 600 men in that department to help the railway men save fuel. He said that without question 50,000,000 tons of coal or 10 per cent of the country's consumption, could be saved by more careful operation of steam generating plants without any expenditure for additional equipment. He pointed out the fact that practicing fuel economy not only saved fuel but reduced greatly the demands on the railroads for transportation.

George R. Henderson, administrative engineer for the Fuel Administration in eastern Pennsylvania, prefaced his remarks with the slogan:

"If we can't can the Kaiser we can help make the can." And the can is made up largely of coal, he said. He described the questionnaire sent out to all steam plants for the purpose of determining whether or not they were using the coal to the best advantage. It has been productive of good results. Committees have been formed in various parts of the country to investigate conditions. The work of such committees in the mills of New England has resulted in a 15 per cent saving in fuel. He spoke of several individual cases where a large amount of fuel had been saved by reducing light, consolidating electric lighting plants, etc. The small plants are the more wasteful. Patriotic posters have been used to a large extent to stir up the interest of the power plant operators and particularly the firemen in saving coal. It is important for everybody to do the best they can with the equipment they have.

Joseph Harrington, administrative engineer for Illinois, spoke of the necessity for considering the personal equation of the men who handle the fuel. He cautioned that particular attention should be given the small plant. There are so many of them that even though the waste at any individual plant may be small the accumulative effect will be very large. Any organization developed on the railroads should be large enough to give the small plants proper supervision. He advocated strongly a two-pen recording draft gage for boilers so that a continuous record of the manner in which a fire is handled could be obtained and the work of the fireman thus supervised. Mr. McAuliffe agreed with him thoroughly in this. Such a device Mr. Harrington explained, would also have considerable moral effect on the fireman. He would fire the boiler correctly for he would know that a record was being kept of his performance. He also spoke of the importance of weighing the coal in order that the fireman will get a better idea of what he is actually doing. It will give him an incentive to improve his work and that is an important point that should in no way be overlooked. Congenial surroundings are also necessary. A conveniently arranged plant, well ventilated and kept picked up and clean will give the fireman a certain amount of pride and self-respect which will be reflected in his work.

Osborne Monnett, engineer for the Fuel Administration, spoke briefly, calling attention to some of the important points that should be watched in the design and operation of boiler plants.

Fuel Oil Must Be Conserved

Nelson G. Phelps of the Oil Division of the Fuel Administration spoke on the fuel oil situation. He said that the time had now arrived when very serious consideration must be given this product. Oil is needlessly wasted. The

Bureau of Mines, a short time ago, estimated that 40,000,000 barrels, or 1,680,000,000 gallons, of fuel oil were wasted yearly due to improper operating methods. It is very easy to waste the oil when it is being burned and it is here that a vast saving must be made. The country is facing a shortage of 29,000,000 barrels and for the last six months it has been necessary to draw from the storage supply.

In calling attention to the oil resources of the country he said that from the time petroleum was first discovered, in 1859, to 1891, the production steadily increased. At that time it was restricted almost entirely to the states of Pennsylvania and New York and the production in those two states during 1891 was 30,000,000 barrels. Last year it was only 9,000,000 barrels. Similarly in Ohio the maximum production came in 1896; in West Virginia in 1900; in Indiana in 1904; Illinois, 1910; California, 1914, and Oklahoma and Kansas will probably have their maximum production this year. The entire production today amounts to about 400,000,000 barrels yearly.

Improper combustion of the fuel oil is responsible for the greatest waste. There should be some one made responsible for fuel oil economy and detailed to instruct the furnace operators in the use of the oil torch. Proper burners should be used. By far the majority of homemade burners are wasteful and it would be decidedly better to purchase a burner that has been designed correctly. Too often the fundamentals of burner construction are not understood. Better efficiency will be obtained with oil heated to 110 deg. before it enters the burner. The Fuel Administration is planning to publish some educational matter on economical fuel oil consumption which will be free for those handling fuel oil.

A Word from Fuel Supervisors

Various representatives of the Fuel Conservation Section spoke calling attention to the more important defects found around the railway stationary plants. By far the most common is improperly lagged steam pipes and boilers, excessive leakage from both air and steam lines, and improperly maintained boiler settings. Mr. Roesch presented some interesting figures showing that with coal at \$3.50 per ton in the furnace, steam at 150 lb. pressure leaking through a $\frac{1}{2}$ -in. hole would waste \$3,340 per year; through a $\frac{1}{32}$ -in. hole \$1,330 per year. Air at 100 lb. pressure with coal at \$2.00 per ton leaking through a $\frac{1}{16}$ -in. hole \$2.89 per month, and through a 1-in. hole, \$741.82 per month. It was stated generally that positive and absolute neglect was responsible for the greatest wastes. In one case a road was extremely short of water at a certain point, and at the same time was wasting 26,000 gal. through leaky valves. Piping should be above ground in order that leaks can be located and stopped. A case was reported where a set of 9-in. locomotive air compressors was used for furnishing air at high pressure to the shop for tools, while a large shop compressor was used to supply air at a lower pressure to the yards. The shop compressor was not used to capacity and the two methods of producing the air were used simply to give a high and low pressure line. With a reducing valve the shop compressor could furnish air for both the shop and the yard.

In some territories where coal has been very cheap it has been difficult to make the men appreciate the value of fuel, but with the extreme shortage throughout the country they are beginning to realize the necessity for economy and while there is a lot to be done in educating these men they are giving their support and co-operation. The fuel supervisors are holding staff meetings at the important terminals. Their attention is not restricted entirely to the mechanical department, the transportation department is in a position to save a large amount of fuel, and men from that department are included in the meetings. Particular stress was laid on what coal

means to this nation and to all of the Allied nations in winning the war. If for the lack of it this country could not do the full measure of work that will be required of it, the length of the war will be increased, and that means that thousands of our American boys will be unnecessarily sacrificed. Saving fuel is the least we can do at home and everybody will do this if they are made to appreciate its importance.

Other Speakers

There were among other speakers at the meeting, H. T. Bentley, superintendent of motive power, Chicago & Northwestern, who told how necessary it was to stir up the enthusiasm of the men in the practice of fuel economy. C. A. Brandt, of the Locomotive Superheater Company, spoke of the possibilities of the superheater in stationary boiler plants, particularly in roundhouses. This practice will reduce the condensation to a large extent.

Mr. Anderson, of the Milwaukee Light & Power Company, Milwaukee, Wis., spoke of the success with which pulverized coal has been used in the power plant of that company under stationary boilers. Boiler and furnace efficiencies of over 86 per cent have been obtained with the pulverized coal, the net efficiency being greater than that obtained with the automatic stokers. The Locomotive Pulverized Fuel Company's apparatus was applied last May, and after changing the design of the furnace to adequately meet the new conditions imposed by this method of combustion no difficulty has been experienced with the proper operation of the plant. Mr. Anderson made it clear that in the design of the furnace lay the secret of success in using powdered coal. He spoke very enthusiastically of the possibilities of this method of firing stationary boilers.

The advantages particularly referred to for this method were the constant degree of efficiency, the fact that constant critical attention was not needed as in the case of stoker or hand firing methods and the ease of control of the fire. The waste of fuel accompanying the banking and cleaning of fires is eliminated. At the plant in question which has peak loads night and morning this feature was of particular importance. It was possible to shut a boiler down at night and by keeping the dampers closed to conserve the heat of the brick work in the furnace, to start the fire in the morning from the heat of the brick, the steam pressure having dropped but little. To operate this system most successfully a sufficiently large installation should be made to warrant a pulverizing plant of sufficient size to bring the cost of preparing the fuel down to a reasonable figure.

Mr. Maddox, of the Missouri, Kansas & Texas, told of the experience that road had had with this method of burning fuel at its Parsons, Kans., plant. A sufficiently large furnace volume and the proper baffling of the boilers is very necessary. He believed that this method of burning fuel had come to stay, particularly in stationary plants. Lignite has been used with especially good success although it was fed to the boiler with seven per cent moisture.

JAPANESE WATCHMEN'S SENSE OF RESPONSIBILITY.—About a month ago a little after midnight, says a recent issue of The Railway Times, Tokio, a person in a jinrikisha was just crossing the railroad tracks at Hibunzaka, as the guards were not closed, when a freight train suddenly came running and struck him down to death. The two watchmen of the crossing soon found that this fatal accident was entirely due to their negligence of duty and realizing their responsibility, threw themselves under a next approaching train and killed themselves. The caps and uniforms which were provided to them by the railways were nicely folded and placed near the place of their death, meaning to return them to their owner.

Orders of Regional Directors

TAMPERING WITH SHIPMENTS OF GASOLENE.—The Eastern regional director orders that outlet valves on the bottom of empty tank cars that contain a small portion of gasoline must not be tampered with by railroad employees; it is a dangerous practice.

Passenger Service.—The Eastern regional director directs attention to the fact that trainmen must not allow passengers to occupy more than one seat at any time, either for themselves or their baggage, when required for other passengers.

Expenses of Joint Ticket Offices.—The Eastern regional director advises that the Director, Division of Public Service and Accounting, has decided that the basis upon which monthly expenses of the joint ticket offices should be distributed is the gross ticket sales for the calendar year 1917, and that this basis should be made effective September 1, 1918.

Red Cross Posters in Railroad Stations.—Permission has been given the Red Cross to post in railroad stations a series of Red Cross posters between now and September 28, when the Fourth Liberty Loan campaign begins. They must be removed at the beginning of the Fourth Liberty Loan campaign.

Increase to Express Messengers.—The Eastern regional director advises that the American Railway Express Company has granted increases to express messengers effective July 1, and it will be proper that the railroads pay their proportion of such increases as in the past. The Express Company officials will be requested to submit a statement to each of the lines indicating to just what extent the increases were made and the proportion to be borne by the railroads. In the case of any messengers who are carried on the payrolls of the railroads, the Express Company has arranged to honor bills for the increase in rates granted under General Order No. 27, so that authority will not be necessary in individual cases.

Bond for Transportation of Merchandise in Customs Custody.—The Eastern regional director advises that a bond has been executed by the director general and accepted by the treasury department for all roads under federal control in lieu of bonds heretofore given by such carriers in the following cases:

1. The transportation of bonded merchandise in accordance with revised statutes, Sections 3000; 3001; 3005; 3006, Act of June 10, 1880, and acts amendatory thereto;
2. The privilege of lading and unlading bonded merchandise at night and on Sundays and holidays under the Act of February 13, 1911.

This bond does not supersede bonds known as consumption entry bonds, internal revenue bonds or warehouse bonds.

Troop Trains.—The Eastern regional director has issued the following rules to govern the furnishing of information as to the contemplated arrival of troop trains:

It is desired that no information with regard to the movement of troops or troop trains be given to any person whatever except as follows:

1. Railroad officers and employees may be given such information as it is necessary for them to have in order to provide for the proper movement of trains.
2. Information necessary may be given to connecting lines in the form provided by the cipher code.
3. Accredited representatives of the Red Cross, upon proper identification at points where troop trains are scheduled to stop, may be informed, upon application of the prospective hour of arrival of such trains. (Note: Where troops or troop trains are moving to a seaport this information must not be given.)

Employees should be instructed as above and should be informed by notice or otherwise that any discussion of troop movements with members of their families or with others is a serious offense.

Agreements Covering Side Tracks, Pipe Crossings, etc.—The Eastern regional director states that inquiry was recently made of the director general's office as to whether the managers under United States Railroad Administration should execute in their own name side track agreements, leases for land, permits for crossing for pipes, conduits, overhead crossings for wires, etc., in which it was contemplated to use

the regular forms heretofore used by the corporation, and stamp them "United States Railroad Administration," etc., and subject to the usual 30, 60 or 90 days' termination.

In view of the fact that many, if not all, of these permits, notwithstanding their short termination, create conditions which may continue indefinitely, it is thought that the managers should prepare the agreements on the usual forms of the corporation, indicate the approval of the manager by his signature at some appropriate place upon the form, and then forward it to the president of the corporation to be executed by himself or such officer as the corporation may designate. Certain documents, of course, which may be of a temporary nature, may be acted upon without troubling the corporation with the details. More specific instructions concerning this and other matters are being formulated by the Administration and will be sent you in due course.

Interview of Officers and Soldiers by Agents of Railroad Administration.—The Eastern regional director quotes from a letter addressed to Hon. John Barton Payne, general counsel, Division of Law, by P. C. Harris, acting for the adjutant general, indicating that the war department has amended its requirements relative to the right to interview officers and soldiers by agents of the Railroad Administration.

Agents of the Railroad Administration will hereafter be considered as "proper officers" within the meaning of Paragraph 824 Army Regulations (relating to the furnishing of information by persons in the military service), and, upon presentation of proper credentials to the commanding officer or officers, will be permitted to interview soldiers at army camps and stations, and all necessary facilities for assisting them will be afforded.

The interviews that will be permitted in such cases will be restricted absolutely to the ascertainment of facts within the personal knowledge or recollection of the officers or enlisted men concerned. No reference to or examination of official records of any description either by the person being interviewed, or by the agent, will be permitted. Evidence from such records, whether at the army camps or stations or in the war department, will be furnished only by the war department, as prescribed by Paragraph 824 Army Regulations, in response to a request therefor made by the proper representative of the Railroad Administration upon The Adjutant General of the Army.

Income Reports.—The following reports and information are now being sent to C. R. Gray, Director, Division of Transportation, Interstate Commerce Commission Building, Washington, D. C.

1. Detailed income reports, showing comparisons with last year and indicating the expenses by primary account.
2. Each report or statement used by transportation officers to measure efficiency and cost of their operations.
3. Report used to measure efficiency and cost of locomotive performances.
4. Usual explanations provided for president or chief operating officer covering increases and decreases as shown in the above mentioned statements.

It is the intention that the reports on the new O. S. Forms will take the place of the reports enumerated under headings 1, 2 and 3, and it will be unnecessary to continue sending the reports last referred to after those which apply to the month of August. The O. S. Forms do not provide for an explanation of increases and decreases in expenses. It will be necessary therefore, for the individual roads to continue sending in such explanation, but it should, as in the case of the O. S. Forms, be sent direct to the Operating Statistics Section, 603 Southern Railway Building, Washington, D. C.

Mis-use of Refrigerator Cars.—The Eastern regional director calls attention to a report of the Refrigerator Car Committee of the Division of Operation as follows:

We wish at this time to call your attention to the misuse of refrigerator equipment, with particular reference to fruit and vegetable refrigerator cars, by permitting them to be loaded with ice in body of the car, also commodities which are permitted by present tariffs to have ice packed in the shipment, such as lettuce and spinach. To maintain an efficient refrigerator car it is imperative that the insulation be kept dry and it is a physical impossibility to construct or mechanically waterproof insulation that will withstand shipments as above referred to without moisture coming in contact with floor insulation.

Another very objectionable practice on the part of some shippers or consignees is to leave in cars when unloaded at warehouses and team tracks large quantities of decayed fruits and vegetables, and at times some of them clean out their warehouses of these articles and put them into the empty cars and allow them to return to the Pacific Coast. When the cars are badly contaminated it requires days and in some cases weeks to clean the car adequately for food products. This practice we believe could be

easily stopped if warehousemen and yard clerks were instructed to see that all refrigerator cars are completely unloaded. We also recommend that oils in any form, or hides, or any other offensive articles be restricted from these cars, as it requires considerable scrubbing and fumigating to remove the stains and odor and the water required will necessarily get to the insulation.

Another practice on the part of some shippers that should be discontinued is the use of nails and spikes through the sides and floor of the car for bracing, as these necessarily puncture the insulation and form a channel for moisture to penetrate the insulation.

Prompt Payment of Freight Charges.—Provisions of General Order 25 requiring the prompt payment of freight charges, are not applicable to the payment of freight charges due from the British Ministry of Shipping, and bills for such charges may be rendered monthly in accordance with General Order 25-A.

Maintenance of Right-of-way Fence.—The Southwestern regional director emphasizes the necessity of close attention to the maintenance of right-of-way fences. Proper maintenance of fences helps to reduce to claim payments for stock killed on the right-of-way and aside from this, it conserves live stock for marketing purposes.

Inter-regional Movement of Special Cars and Special Trains.—The Southwestern regional director states that inter-regional special car and special train movements may be made regardless of whether such movements are in accordance with published tariffs if the initial line receive special authority from its regional director. Connecting lines may continue the movement on the assurance from the initial line that authority has been obtained. The regional director in charge of the initial line will obtain authority for the continuation of such movement when necessary from the regional directors interested and at the time of granting permission for the movement to the initial line.

Treating of Cross Ties.—The Northwestern regional purchasing committee sets forth rules prepared by the Central Advisory Purchasing Committee for the purpose of preventing interference by commercial treating plants with the programme of the Railroad Administration in securing its supply of ties. The rules specify that no arrangement should be made with any commercial tie treating plant both to furnish and treat ties. Contracts should cover only the treatment of ties to be furnished by the railroad from its regular source of supply. In order that railroads may avail themselves of an immediate source of possible supply and prevent possible financial loss to those commercial treating plants which have already purchased cross ties for treatment and resale, the regional purchasing committees may buy from any commercial plants in the region all the ties that they may now have on hand at their plants either treated or ready for treatment, or any ties which may be at this time enroute to their plant as a result of previous purchases. Ties purchased in this manner may be distributed by the committee to the roads most in need of them. The Forest Products section of the Central Advisory Purchasing Committee is compiling the information necessary to formulate a definite plan for making use of the capacity of facilities of all commercial tie and lumber treating plants and for distributing the available supply of railroad ties and timber among them to the best advantage, thereby preventing confusion and interference of action between the railroads and the plants. The rules apply to all switch ties and cross ties either hewn or sawn.

Locomotive Coal.—The Northwestern regional purchasing committee announces that the Railroad Administration has authorized the Fuel Administration to divert from railroad use such high grade gas and by-product coal as may be required to carry on the government's steel production programme. It is understood, however, that the Fuel Administration will arrange in advance for an adequate supply of the most satisfactory quality of other coal available for railroad use. Before submitting the changes in coal supply by local fuel administrators, however, the railroads are requested to advise the regional purchasing committee.

The committee announces also that the order of the United States Fuel Administration establishing a price for tipple coal has been modified to permit negotiations between operators and individual railroads for coal taken directly from tipples to locomotives at mines. It is recommended that the amount of coal so taken be increased if possible, to avoid the use of cars. The average number of tons per day so delivered is to be reported to the regional purchasing committee.

Specifications for Chain.—The Northwestern regional purchasing committee announces that the Chain Section of the War Industries Board requests that railroads adopt standard specifications for chain for locomotive tenders and cars, and also that the inspection of chains be made only at the manufacturers' plants. The circular is accompanied by the Railroad Administration's specifications for chains, which the railroads are asked to examine for the purpose of determining whether such chains can be generally applied.

Salary Increases to Subordinate Officials.—In Circular 28, dated August 31, the Northwestern regional director announces salary increases to subordinate officials, effective August 1.

1. Assistant yardmasters will be paid on an hourly basis of eight hours per day, at a rate five cents higher than the day or night yard foremen's rates.

2. Assistant general yardmasters will be paid at a monthly rate on the basis of 10 per cent over the earnings of an assistant yardmaster on a ten-hour basis.

3. General yardmasters will be paid on a monthly basis at a rate 20 per cent over the wages of an assistant night yardmaster working 10 hours, with a maximum of \$250 per month. Yardmasters at outside points where no assistant yardmasters are employed will be paid the same rate as an assistant day yardmaster working ten hours per day.

4. Trick despachers will receive an increase of 20 per cent over the present rate with a maximum of \$210 per month.

5. Chief despachers and night chief despachers will receive an increase of 20 per cent over their present rates with a maximum of \$250 per month.

6. Trainmasters and assistant superintendents will receive an increase of 20 per cent with a maximum of \$275. In some cases assistant superintendents or trainmasters are now paid \$275, or more, in which cases adjustments should be made in individual cases on the merits in each instance after negotiation with the regional director.

7. Road foremen of engines, travelling engineers and traveling firemen will receive an increase of 25 per cent with a maximum of \$250 per month.

8. Roadmasters will receive an increase of 25 per cent generally.

Railroads are asked to submit recommendations for increases in the rates of pay of superintendents, master mechanics, etc., and these recommendations will be acted upon promptly upon receipt.

Interpretation of Clause Regarding Commissions, etc.—In Supplement 5 to Circular R. P. C. 11, dated September 5, the Northwestern Regional Purchasing Committee sets forth six questions raised by the assistant general counsel of the Railroad Administration relating to the interpretation of the attorney general's ruling pertaining to contingent commissions, etc., and answers from the assistant attorney general of the United States:

Question 1. Does the character of federal control of railroads require a different interpretation of these requirements than a direct contract for supplies for the war department, etc.? Answer. The character of federal control of railroads does not require a different interpretation of the covenant against contingent fees than that which applies to the war and other departments of the government.

Question 2. Does the clause apply to a contract involving a commodity upon which the government has fixed a price if the contract is made at that price and the contractor pays a commission? Answer: No.

Question 3. Suppose a contract, calling for deliveries and payments during federal control, was entered into between the railroad company and the contractor prior to federal control, the contractor having agreed to pay a commission as payments are made; the Railroad Administration in taking over the property takes over the contract as well and on subsequent payments by it on the contract, the contractor is to pay a commission. Would this situation be affected? Answer: No.

Question 4. Is the clause intended to cover an instance where the contractor has a regularly accredited representative as his employee in the capacity of sales agent who is paid:

(a) On a salary and commission basis;

(b) On an exclusive commission basis according to sales;

(c) On an exclusive commission basis in a certain territory covered by him.

It is understood in the above cases that the contract is negotiated by the sales agent in the name of the principal. Answer: Yes.

Question 5. In the cases set forth under No. 4 above would it make any difference if the representative was so employed by the contractor prior to federal control and continued in such capacity during federal control? Answer: No.

Question 6. Does the clause apply in the case of a manufacturer's agent operating on an exclusive commission basis as the representative of several companies where the agent negotiates the contract in the name of the company he represents? Answer: The covenant prohibits the payment of contingent fees to manufacturers' agents operating on an exclusive commission basis as a representative of several companies where the agent negotiates the contract in the name of the company he represents.

Rates of Pay to Piece Workers.—The Northwestern regional director outlines the practice which will be followed in applying the provisions of General Order 27 and its supplement 4 to piece workers. This class of labor will receive for each hour worked the same increases per hour as have been awarded to the hourly worker engaged in similar employment in the same shop. Piece workers, like other workmen, will be subject to the minimum allowances, specified in Supplement 4, and the provisions for the payment of time and one-half time for overtime, including Sundays and the following holidays: New Year's Day, Washington's Birthday, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas. Railroads having the piece work plan in effect for car or locomotive repairs are requested to submit to the office of the regional director their recommendations as to any further increase in piece work rates which should, in their opinion, be made.

An Electric Snow Melting Device

SNOW STORMS AND BLIZZARDS have come to be an accepted excuse for the breaking down of train schedules. One of the problems is to keep the switches and their throwing mechanism free so that they can be operated promptly in any conceivable kind of a storm. The "snow in the switches" is a very important cause of delay in terminals, and at busy junctions and detouring places, and if the turnouts can be kept in service, much trouble can be avoided.

The common method of attempting this is to have men shovel the snow out and then brush the switch points clean with brooms. There are a number of objections to this, where there are many trains or fast ones. The first objection, for this year at least, is that there are not enough men to do it. Another is that when the wind is heavy the men are not able to do the work. If the snow blows in between the stock rail and the switch point at the rate of 60 miles an hour, it is evident that it will be difficult to brush it out with brooms. The points that are operated by switch stands can be taken care of, but it may take a great deal of time. At an interlocking plant, where the men have to clear the snow out of the switches, then step back and signal to the operator of the interlocking station and have him attempt to make the movement, the delay is apt to be more serious, and detentions accumulate with the number of trains. Near the big cities it is not clear to all our laborers that they should endure hardships and work long hours at their normal rate of pay, when they can send word to their foreman that they are sick, and then work at more comfortable jobs for a few days with the contractors and make more money. Of course, there are many loyal men, but it is a temptation to which men who have inadequate clothes for these extreme conditions do yield occasionally, and if they do fail to report, it is at a time when the railroads cannot well employ extra or new men to take their chances on busy tracks. There is danger to men who try to do this work when there is a blinding storm, whether they are experienced or not. It is only necessary to ride an engine in a bad storm to realize the danger to men on the tracks, especially if there are a number of tracks and, therefore, several routes that a train may take.

An electric heater device has been developed to help keep the switches clear from snow, and to decrease the amount of labor required. The heater units are enclosed in a $3\frac{1}{2}$ -in. wrought iron pipe, 20 in. long, and a battery of them is placed between the ties, just under the rail. They are wired

from a circuit, as the amount and character of the supply current makes necessary, and a switch is placed in this wiring at some convenient point clear of the track. The current can be turned on by an employee as the snowstorm starts. The heat generated does the rest.

The temperature in the heater rises about 100 deg. C. in the first half hour, and by the end of an hour is about 135 deg. C. above the outside temperature. This heat is not enough to set fire to anything, but is enough to take the frost out of the ground so that drainage is provided and the snow which falls on the ground is melted. This melting snow makes a light mist which prevents the accumulation of snow or its freezing on the slide plates, and keeps the space on the slide plates, or under the tie rods or other mechanism where it is placed, free for operation. In an ordinary storm this is completely effective and the track above the heaters is kept as dry and clear as a floor. It is effective also with a con-



A Switch Outfitted With the Thawing Device With the Covering to Confine the Heat

siderable wind, provided that wind is at an angle with the track.

During three years' trial with these heaters there has been only one situation where men were required on the switches in addition to the heaters, and that was when there was a violent wind parallel to the track, so that none of the rails acted as a wind-break. In this particular case, and it occurred once, the snow was driven between the switch point and the stock rail faster than it could be melted, and all the men possible were put on the switches at this location to keep them clear. To remedy this particular condition, a covering was put over the tie rods and the space housed on either side of the main track rail and the adjacent switch point, so that the only vulnerable part of the switch left exposed was that space between the stock rail and the main track rail adjacent. The heaters were placed under this protection, so that the heat was confined and allowed to escape only through this space. This housing is made of wood to prevent the heat escaping or being transmitted, except the plate which moves with the point, which is made of metal, so that the heaters keep it warm and prevent the accumulation of snow or ice upon it which would result in stopping its free movement back and forth over its supports as the switch is operated. Various parts of this are hinged so that easy access is provided to inspect the switch and make adjustments during the storms. This was tried one year on two switches and was completely successful.

Each of these heaters takes 11 amperes and requires $36\frac{2}{3}$ volts. The heaters can be used for either A. C. or D. C. current with equal effectiveness. For a turnout with 15-ft. switch points there have been used 18 of these heaters to fit the current on which they were tried. This gives a total current consumption for these 18 heaters of 7.26 K. W. per hour.

This device was developed under the direction of Francis Boardman, division engineer on the New York Central, at New York. It is being placed on the market by The Q & C Co., New York.

General News Department

The contractual relations between railroads and telegraph companies are to be examined by a committee which has been appointed by the postmaster general. It is composed of Joseph Stewart, special assistant to the attorney general; G. W. E. Atkins, vice-president of the Western Union Telegraph Company, and John Barton Payne, general counsel of the Railroad Administration. The committee will report what changes, if any, should be made in these contracts or in the service rendered.

The Philadelphia Rapid Transit Company has taken a policy in the Metropolitan Life Insurance Company, New York City, covering \$1,000 on the life of each employee of the road who has been in the service one year or longer. About 7,000 employees will have the benefit of this arrangement. An individual policy for \$1,000 will be given into the personal custody of each member. In the event of the employee leaving the service, the insurance company undertakes to reinsure him without requiring a physical examination. It is said that an employee who has been with the company for many years and who has been paying at the rate of \$72 a year for a \$1,000 policy, will be enabled to obtain the same protection, plus sick benefits of \$10.50 per week and a \$40 monthly pension, for an annual outlay of \$12; and this is a typical case. The liberal provisions of the arrangement are made possible by joint co-operative effort. By pooling the interests of many thousand employees, plus the contribution of \$120,000 per year by the company, it is possible for each individual member to obtain a measure of protection otherwise out of the question.

Western Railway Club Meeting

The Western Railway Club will hold the first meeting of the year at the Hotel Sherman, Chicago, on Monday, September 16. The gathering will be in the nature of a keynote meeting intended to inspire the members to greater efforts in the coming months. M. K. Barnum, assistant to the vice-president of the Baltimore & Ohio, will present a paper and several other prominent railroad officers will give short talks. As is customary, a dinner will be served at the hotel at 6:30 p. m. and the meeting will convene at 8:00 p. m.

Standard Baggage Car Designs

The United States Railroad Administration has completed designs for a 70-ft. standard baggage car and is working on the designs for a 60-ft. baggage car. Alternate designs have been developed for the 70-ft. car, one having the usual type of built-up-end construction, and the other a cast-steel-end construction. The latter, in addition to a combination platform and body bolster casting, includes a cast-steel vestibule-end frame. It is reported that from 1,200 to 1,500 cars will be ordered from the standard designs.

Changes in Personnel, Bureau of Railway Economies

Important changes have recently been made in the personnel and scope of the Bureau of Railway Economics, Washington. The Bureau, on July 1, was transferred to the control of the railroad corporations—that is, the organizations outside the United States Railroad Administration—and these corporations, the original supporters of the Bureau, decided to continue its work at least until the end of this year. Arrangements have now been made which virtually insure its continuation after that time, with special attention to the study of the various aspects of government control of the railroads. W. J. Harahan, chairman of the executive committee, retired from the committee on his appointment as federal manager of the Seaboard Air Line, and

Howard Elliott, chairman of the Northern Pacific, was elected to succeed him. R. H. Aishton and C. H. Markham had retired from the committee on their appointment as regional directors of the Railroad Administration, and their places will be filled later. Prof. Frank Haigh Dixon, who had been chief statistician of the Bureau since October 1, 1910, resigned on July 15 and is now giving his time to his duties as transportation expert for the United States Shipping Board, making a study of ocean freight rates; and he has been succeeded by Julius H. Parmelee, who has been statistician of the Bureau since May, 1911.

New Preference List of Essential Industries

Railways operated by the United States Railroad Administration are placed in the first of four classes of a revised preference list of industries and plants compiled by the Priorities division of the War Industries Board, establishing the order of priority as the governing factor in the distribution of labor, capital, facilities, material, transportation and fuel and also as the basis for industrial exemption from the draft. The list, which is described as the master-key governing the flow of basic industrial elements to the industries essential to the war program, was made public on September 9, superseding all previous listing. In it the priorities division has grouped major industries, according to their relative importance, into four great classes, consideration being given in this grouping to the factors of intrinsic importance of the product for use during the war and the urgency, the necessity for maintaining or stimulating and increasing the total quantity of production, and the proportion of the capacity of the industry or plant devoted to the production of essential products.

Railways not operated by the Railroad Administration (excluding those operated as plant facilities) are placed in the second class. The railway supplies industry as such is not listed but the preference list includes several classes of plants engaged in producing the basic materials entering into railway equipment and supplies. Among these are: Plants engaged principally in manufacturing locomotives or travelling cranes, class II; plants engaged principally in manufacturing electrical equipment, class III; plants engaged principally in manufacturing machine tools, class II; steel making furnaces, class I; steel plate mills, class I; steel rail mills, class II; and all plants operating steel rolling and drawing mills, exclusive of those taking higher classification, class III.

The list is issued "for the guidance of all governmental agencies and all others interested in (1) the production and supply of fuel and electric energy, (2) in the supply of labor, and (3) in the supply of transportation service by rail, water, pipe lines or otherwise, in so far as such service contributes to production of finished products." It is made up of industries and plants which in the public interest are deemed entitled to preferential treatment. The inclusion of the industries and plants on the list does not operate as an embargo against all others, but the effect is to defer the requirements of all other industries and plants until the requirements of those on the preference list shall have been satisfied. The industries and plants grouped under class I are only such as are of exceptional importance in connection with the prosecution of the war. Their requirements must be fully satisfied in preference to those of the three remaining classes. Class I includes air craft, ammunition, army and navy, small arms, blast furnaces, chemicals, coke, coal, domestic consumers, explosives, feed, foods, guns, oil and gas, public institutions and buildings, ships, and steel.

Priorities in the supply and distribution of raw materials, semi-finished products and finished products are to be governed by Circular No. 4 issued by the priorities division under date of July 1 and its amendments and substitutes.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1915

Name of road.	Operating revenues—Total			Operating expenses—Total			Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Operating (or deer.) comp. with last year.
	Average mileage operated during period.	Freight.	Passenger. (inc. misc.)	Maintenance of Way and Equipment structures.	Traffic.	Transportation.					
Pennsylvania Company	1,754	\$7,623,187	\$1,555,717	\$10,094,822	\$1,154,962	\$1,750,717	\$76,742	\$3,605,542	\$6,806,083	\$57,42	\$3,288,739
Pennsylvania Railroad	5,342	25,265,119	9,756,948	37,600,003	3,635,750	7,935,557	292,159	13,802,738	697,593	70,88	11,017,620
Pefia & Pekin Union	19	28,863	7,477	11,257,55	1,267,50	20,697	50	71,187	3,862	97,25	3,093
Pete Marquette & Lake Erie	2,233	1,059,164	482,891	3,227,074	466,848	349,969	794,724	57,329	1,871,136	55,149	802,835
Pittsburgh & Lake Erie	2,224	2,837,413	227,418	3,265,198	389,694	569,473	16,133	42,339	1,819,129	55,71	1,446,700
Pittsburgh & Shawmut	94	130,566	4,112	136,095	29,413	34,011	1,119	44,579	12,535	82,03	24,446
Pittsburgh & West Virginia	63	182,364	9,920	208,591	4,5460	50,518	814	6,945	182,057	87,28	2,363,534
Pittsburgh, Cinc. & St. Louis	2,386	6,087,239	1,902,253	8,898,933	82,357	2,007,403	88,973	3,002,622	6,219,400	69,88	2,679,978
Rutland	415	221,077	115,209	396,405	6,979	1,967,555	1,967,555	1,72,241	9,896	66,895	17,459
St. Louis-San Francisco	4,761	4,121,480	2,093,217	6,510,177	755,009	1,070,426	43,633	2,161,787	156,766	64,18	2,331,872
Seaboard	3,561	1,732,786	1,466,974	3,470,525	3,455,792	665,351	57,358	1,329,040	84,288	75,19	8,607,711
Southern R. R. Ass'n of St. Louis	6,982	7,255,093	4,312,544	12,362,232	1,197,782	1,967,555	128,032	4,151,225	199,237	72,37	4,653,657
Terminal R. R. & Ft. Smith	36	77,258	4,028	316,852	4,332	4,332	909	135,881	6,707	72,58	80,530
Texarkana & Ft. Smith	81	666,206	170,355	16,575	10,1787	14,504	2,067	6,266	62,415	61,32	39,571
Trinity & Brazos Valley	469	448,206	663,607	72,521	91,424	4,673	226,086	11,123	411,441	62,00	253,167
Toledo & Ohio Central	435	1,073,601	77,557	1,189,991	125,185	231,415	6,701	379,346	15,871	63,90	429,582
Toledo, Peoria & Western	247	92,529	42,406	180,237	78,920	137,471	117,023	6,337	132,796	87,13	19,601
Union Pacific	3,630	6,398,912	1,729,350	8,732,059	812,235	26,337	1,822	50,228	8,674	124,408	133,69
Virginian	518	1,040,010	633,339	1,175,053	142,489	215,250	7,289	392,766	14,544	64,88	412,662
Wabash	2,519	1,016,798	1,017,136	368,600	851,116	1,29,458	190,871	70,629	49,813	88,409	76,300
West Jersey & Seashore	359	1,009,699	1,009,699	21,032,296	87,119,566	11,032,316	9,123	475,181	2,087	842,774	65,26
Western Maryland	707	1,234,447	106,324	1,415,524	189,776	394,293	13,683	567,958	30,998	85,32	207,869
Western Ry. of Alabama	133	1,221,262	40,039	183,718	21,181	40,642	3,803	6,625	144,866	78,85	38,853
Wheeling & Lake Erie	511	1,396,456	48,856	1,559,024	1,559,024	209,763	232,798	6,628	486,671	257,479	61,41
SEVEN MONTHS OF CALENDAR YEAR 1918											
Alabama Great Southern	312	\$3,190,926	\$1,258,009	\$4,751,923	\$380,939	\$1,082,104	\$93,123	\$1,813,428	\$100,776	73,56	\$1,256,632
Arizona Eastern	377	2,091,408	327,057	2,578,392	470,569	470,569	17,557	\$1,646,739	120,423	64,50	\$1,915,303
Atchison, Topeka & Santa Fe	8,646	59,221,664	21,032,296	87,119,566	11,032,316	15,154,729	1,079,942	30,447,249	1,663,089	72,81	281,034,23
Atlanta & West Point	93	2,280	31,082,351	31,082,351	3,467,473	6,014,586	32,9,526	13,065,009	678,558	23,737,403	76,36
Baltimore & Ohio	4,948	63,362,453	15,799,866	86,666,075	12,168,954	23,103,336	1,260,866	43,116,081	2,186,581	82,427,429	95,11
Bessemer & Lake Erie	2,08	22,935,975	21,20,919	65,557,783	1,736,559	81,181	1,43	2,438,647	1,35,155	72,51	1,844,146
Boston & Maine	2,305	22,935,710	10,26,024	37,157,516	5,051,695	7,09,646	278,760	2,16,646	5,963,369	93,90	2,265,363
Buffalo, Rochester & Pittsburgh	584	8,778,701	744,481	9,894,276	1,378,447	3,100,418	117,293	2,16,226	4,648,212	95,69	426,064
Carolina, Clinchfield & Ohio	282	2,204,108	228,851	2,498,346	313,721	591,143	75,300	315,168	1,915,547	76,66	728,799
Central of Georgia	1,918	3,116,401	3,108,644	11,316,515	1,654,355	1,976,262	288,973	4,423,877	353,433	76,43	2,880,026
Central New England	1,301	3,071,441	168,253	3,392,272	504,059	550,626	28,918	1,723,895	521,182	87,10	437,405
Central Vermont	411	2,956,936	450,387	2,80,101	411,35	598,003	57,583	1,740,888	85,164	105,29	148,215
Charleston & Ohio Lines	342	1,181,283	355,579	1,540,592	235,634	25,606	21,760	2,16,110	1,245,594	89,85	238,836
Chicago & Alton	2,479	28,033,045	6,577,209	37,013,814	4,878,682	9,284,579	319,463	14,180,66	742,048	29,588,379	79,93
Chicago, Indianapolis & Louisville	1,050	8,589,654	3,019,387	12,481,618	1,713,333	2,911,114	208,822	5,620,830	280,768	86,56	1,676,310
Chicago, Junction & St. Paul	269	4,669,467	1,40,009	5,549,592	1,019,802	10,5263	3,092,841	5,564,174	1,490,227	100,25	676,760
Chicago & North Western	8,094	43,125,503	15,081,263	67,671,988	9,288,366	12,184,826	12,78,600	67,997	1,490,343	88,23	1,247,274
Chicago, Burlington & Quincy	9,373	53,599,323	15,053,517	75,423,315	10,842,895	14,838,761	6,761	75,753	30,892,898	1,930,202	15,204,824
Chicago Great Western	1,496	6,684,048	2,639,446	10,123,320	1,643,951	2,362,841	265,910	4,634,886	291,657	9,295,096	91,82
Chicago, St. Paul, Minn. & Omaha	1,749	8,623,385	3,415,954	12,965,344	1,494,024	2,404,164	161,892	6,76,644	366,070	86,61	1,735,239
Chicago, Terre Haute & Southeastern	1,374	2,355,970	2,068,175	3,50,954	2,136,649	300,741	6,406	1,351,323	51,098	105,18	104,904
Cincinnati, Northern & Western	474	1,674,974	1,43,222	67,671,988	9,288,366	12,184,826	81,1378	3,257,446	1,643,377	105,18	1,577,688
Cincinnati, Rock Island & Gulf	245	1,281,610	10,9,767	1,43,222	2,447,914	6,123,521	368,139	24,036	1,248,729	80,41	1,307,684
Cleveland, Cincinnati, Chic. & St. Louis	2,390	25,02,488	7,965,357	36,385,712	3,839,223	6,692,562	552,497	15,5,244,559	703,463	8,841,153	2,603,574
Coal & Coke	197	535,697	146,642	764,7182	183,712	292,666	10,306	388,029	26,700	117,95	1,37,224
Colorado & Southern	1,101	5,207,950	1,13,545	6,779,350	785,455	1,468,499	65,762	2,531,043	246,624	5,133,879	75,72
Cumberland Valley	1,163	2,164,056	414,854	2,744,518	381,604	370,086	1,098,159	84,292	1,883,660	67,82	64,999
Delaware & Hudson Co., R. Dept	878	15,904,481	1,496,676	18,453,351	1,954,628	4,847,528	1,704,790	92,35	1,411,560	546,854	864,458
Delaware, Lackawanna & Western	955	26,769,931	5,620,712	36,295,569	2,568,030	6,609,824	458,146	16,221,211	26,865,661	74,01	9,429,408

Increase (or deer.) comp. with last year.

Operating (or deer.) comp. with last year.

REVENUES AND EXPENSES OF RAILWAYS

SEVEN MONTHS OF CALENDAR YEAR 1918—CONTINUED

Name of road.	Average mileage operated during period.		Operating expenses						Maintenance of equipment.		Net from railway operation.		Railway tax accruals.		Operating income (or loss).		Increase (or decr.) comp. with last year.		
	Freight.	Passenger. (inc. misc.)	Traffic.	Trans- portation.	General.	Total.	Operating ratio.												
Denver & Rio Grande	\$2,668,284	\$1,957,973	\$10,469	\$426,245	\$6,837	\$189,715	\$5,945,509	\$42,612	\$12,769,116	124.03	\$3,196,717	\$2,448,830	\$1,937,666	\$1,937,666	\$1,937,666	\$1,937,666	\$1,937,666		
Denver & Salt Lake	1,937,752	1,137,787	1,593,661	1,137,787	1,593,661	1,593,661	1,593,661	1,593,661	1,593,661	1,593,661	63,021	—	—	—	—	—	—	—	
Duluth, Missabe & Northern	8,905,546	8,903,843	9,657,785	9,657,785	9,657,785	9,657,785	9,657,785	9,657,785	9,657,785	9,657,785	544,011	44,64	5,296,638	—	—	—	—	—	
El Paso & Southwestern Co.	1,028	1,487,958	1,487,958	1,487,958	1,487,958	1,487,958	1,487,958	1,487,958	1,487,958	1,487,958	5,034,066	5,034,066	4,752,626	2,36,933	2,36,933	2,36,933	2,36,933	2,36,933	
Erie	1,989	33,548,908	6,016,579	44,038,598	6,016,579	44,038,598	6,016,579	44,038,598	6,016,579	44,038,598	1,184,033	47,363,552	107,55	3,521,924	3,521,924	3,174,865	—	—	—
Florida East Coast	764	3,231,067	5,618,542	1,658,306	5,618,542	594,091	703,738	29,704	21,46,764	130,283	3,869,222	68,86	2,049,320	286,982	1,760,860	—	—	—	
Ft. Worth & Denver City	454	2,842,727	1,058,720	4,097,930	404,059	914,799	40,015	1,740,311	1,58,579	79,95	821,591	149,150	672,346	211,878	—	—	—	—	
Fonda, Johnston & Gloversville	88	191,472	395,470	8,228,007	2,818,781	11,66,439	1,418,129	1,579,681	194,572	4,50,429	210,061	45,578	243,378	31,517	211,878	—	—	—	
Galveston, Harrisburg & San Antonio	1,360	8,748,007	2,818,781	11,66,439	1,418,129	1,418,129	1,418,129	1,418,129	1,418,129	1,418,129	35,039	8,087,449	3,79,991	3,288,340	—	—	—	—	
Georgia	328	2,092,458	10,34,740	3,377,239	288,109	405,703	60,019	1,432,163	88,320	2,245,525	66,48	1,131,714	1,086,294	61,684	—	—	—	—	
Gulf, Colorado & Santa Fe	8,258	35,450,667	8,619,379	48,339,017	9,548,191	9,202,156	23,924,290	97,869	2,276,339	68,86	2,049,320	286,982	4,343,722	9,170	2,078,782	—	—	—	
Hocking Valley	349	2,842,727	1,058,720	4,097,930	404,059	914,799	40,015	1,740,311	1,58,579	79,95	821,591	149,150	672,346	211,878	—	—	—	—	
Houston & Texas Central	948	8,748,007	2,818,781	11,66,439	1,418,129	1,418,129	1,418,129	1,418,129	1,418,129	1,418,129	35,039	8,087,449	3,79,991	3,288,340	—	—	—	—	
International & Great Northern	1,159	4,626,013	2,123,089	8,227,122	1,022,895	1,498,704	11,688	3,382,450	267,627	6,269,061	86,21	1,086,294	61,684	—	—	—	—	—	
Lake Erie & Western	900	4,376,176	3,51,124	4,982,875	1,658,306	9,202,156	23,924,290	97,869	2,276,339	68,86	2,049,320	286,982	4,343,722	9,170	2,078,782	—	—	—	
Lehigh & Hudson	1,443	27,848,670	3,245,368	8,226,029	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	
Long Island	398	2,882,313	8,606,444	12,11,879	7,88,140	1,31,763	1,52,480	181,039	1,52,480	1,52,480	1,52,480	1,52,480	1,52,480	1,52,480	1,52,480	1,52,480	1,52,480	1,52,480	
Los Angeles & Salt Lake	1,116	5,133,133	1,12,631,581	2,123,089	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581	1,12,631,581
Louisville & Nashville	5,043	36,975,181	12,631,999	52,503,516	6,539,780	11,287,078	85,105	21,59,998	966,844	1,411,642	11,67,714	78,87	11,09,84	1,667,766	9,415,058	1,855,743	—	—	—
Louisville, Henderson & St. Louis	199	1,050,987	3,245,368	8,226,029	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	—
Maine Central	1,216	5,134,354	1,058,720	4,097,930	404,059	914,799	40,015	1,740,311	1,58,579	79,95	821,591	149,150	672,346	211,878	—	—	—	—	—
Maryland, Delaware & Virginia Ry. Co.	1,882	3,245,368	8,226,029	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	—
Missouri, Oklahoma & Gulf	332	2,786,593	194,320	3,10,031	11,688	1,030,117	2,123,089	8,619,379	8,619,379	8,619,379	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	—
Missouri Pacific	7,301	33,259,348	10,776,262	47,826,454	7,796,697	9,402,670	7,797,720	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	
Morgan's Law & Tex. R. R. & S. S. Co.	400	3,148,354	1,058,720	4,097,930	404,059	914,799	40,015	1,740,311	1,58,579	79,95	821,591	149,150	672,346	211,878	—	—	—	—	—
Nashville, Chattanooga & St. Louis	1,236	3,245,368	8,226,029	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	8,619,379	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	—
New Orleans Great Southern	284	2,786,593	194,320	3,10,031	11,688	1,030,117	2,123,089	8,619,379	8,619,379	8,619,379	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	—
New York Central	6,079	94,064,303	35,103,111	149,612,328	18,238,554	12,955,017	1,637,115	69,396,837	69,396,837	69,396,837	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	—
New York, Chicago & St. Louis	571	9,773,742	11,602,626	47,826,454	7,796,697	9,402,670	7,797,720	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	
Pennsylvania Company	1,754	34,731,927	8,315,572	47,826,454	7,796,697	9,402,670	7,797,720	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	1,139,419	
Pennsylvania Railroad	5,342	10,20,299,133	50,567,741	189,204,651	25,237,384	49,177,283	1,867,125	525,392	525,392	525,392	1,139,419	93,037	1,47,790	88,00	1,130,294	408,134	—	—	—
Norfolk & Western	2,083	35,841,432	5,21,124,6	5,21,124,6	5,21,124,6	5,21,124,6	5,21,124,6	5,21,124,6	5,21,124,6	5,21,124,6	390,453	15,945,688	854,042	88,96,365	1,09,022	—	—	—	—
Northern Pacific	6,597	31,360,799	3,078,314	11,117,637	1,23,052	5,21,124,6	5,21,124,6	5,21,124,6	5,21,124,6	5,21,124,6	30,604,675	20,67,393	33,819,288	7,89,744	8,340,414	8,340,414	8,340,414	8,340,414	8,340,414
Oregon Short Line	2,313	13,212,318	3,471,845	18,028,712	2,548,699	17,245,209	2,449,895	3,586,998	3,586,998	3,586,998	17,245,209	11,62,633	5,41,935	593,333	11,62,646	6,40,248	1,10,247,8	1,10,247,8	1,10,247,8
Pennsylvania, Pittsburgh & Shawmut	94	9,13,407	62,890	1,065,307	5,794,553	6,40,48,901	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	1,96,449	
Pennsylvania, Pittsburgh, Cincinnati, Chic. & St. Louis	63	31,156,666	5,14,705,307	5,14,705,307	5,14,705,307	5,14,705,307	5,14,705,307	5,14,705,307	5,14,705,307	5,14,705,307	39,752	21,306,996	41,205,336	41,205,336	41,205,336	41,205,336	41,205,336	41,205,336	
Pere Marquette & Pekin Union	36	519,406	20,831	2,083,210	2,083,210	2,083,210	2,083,210	2,083,210	2,083,210	2,083,210	6,195,510	1,04,510	3,97,522	3,97,522	3,97,522	3,97,522	3,97,522	3,97,522	
Pittsburgh & Lake Erie	474	2,308,383	1,03,431,196	11,308,823	3,66,731,345	5,381,558	7,93,875	3,77,002	14,860,697	14,860,697	10,79,782	29,693,605	80,977	6,97,740	5,17,500	5,17,500	5,17,500</td		

Collision at Alliance, Nebraska

In a butting collision on the Chicago, Burlington & Quincy, seven miles west of Alliance, Neb., on Tuesday, September 10, between westbound passenger train No. 43 and an eastbound work train, 12 passengers were killed and 18 passengers and trainmen were injured. Failure of the work-train conductor to protect against the passenger is given as the cause of the collision.

Chicago to New York in 12½ Hours

An airplane was started from New York on Thursday morning, September 5, with mail bags which it was hoped to deliver in Chicago the same afternoon, the air line distance between the two cities being about 800 miles, and the intention being to travel at from 70 to 100 miles an hour; but the aviator did not reach Cleveland until about 9 p. m., and he was compelled to stay there over night. He arrived at Chicago at 7 o'clock on the evening of the second day.

The aviator started back from Chicago for New York on Monday morning, September 9, carrying 2,000 pieces of mail, but he was compelled to stop overnight at Lockhaven, Pa., on account of trouble with his radiator, and he reached New York at 11:32 a. m. on Tuesday. His actual time in the air was 7 hours 52 minutes, or a little better than 100 miles an hour. Having some mail for Washington, he left New York at 12:10 p. m., and reached Washington at 3:07 p. m.

Another aviator who, according to the plans, was to follow the first one within a short time, was detained, and left Chicago on Tuesday morning at 6:25; and this one succeeded in reaching New York the same day; but he did not arrive until 8 o'clock at night; and he was so high above the earth that he lost his bearings and groped around Long Island and over the Atlantic Ocean and Long Island Sound for about two hours before he landed; and then he came down at Hicksville, some 15 miles beyond Belmont Park, the regular landing place. This man and his mechanician, who rode with him, were clothed with electrically heated garments.

A. E. R. A. Convention Postponed

The Executive Committee of the American Electric Railway Association has decided, in view of the present conditions, that it would be unwise to hold a convention along the lines of its original plan, and accordingly arrangements for holding the meeting in Atlantic City, October 8, 9 and 10 will be cancelled. There will be substituted a one-day meeting to be held in New York on a date to be determined later.

American Gear Manufacturers' Association

The semi-annual meeting of the American Gear Manufacturers' Association will be held at the Onondaga Hotel, Syracuse, New York, September 19, 20 and 21.

A portion of the program has been announced as follows: "Priority," by Charles A. Otis, of the Priority Committee.

"What Is the Possibility of Women Becoming a Permanent Factor in the Gear Industry"—W. H. Diefendorf.

"Trade Acceptances"—C. E. Crofoot.

"The Outlook of the Steel Supply"—C. E. Stuart, secretary and treasurer of the Central Steel Co., Massillon, Ohio.

"TRAVELING CONDITIONS IN FRANCE," says a Paris correspondent of the Westminster Gazette, "is not only a matter of high fares, infrequent trains, overcrowded cars, slow journeys, but it is also a question of papers. We have got the paper habit in France." In other words, travel is a matter of many formalities, and it is necessary to make something of a study in geography before setting out on a journey of any length, owing to the number of "zones" into which the country is divided. The result of all the resulting restrictions, which have, however, undergone some slight relaxation of late, is that it is extremely difficult for civilians to travel, and if the necessary permits have been obtained the passenger has to put up with far more inconvenience, delay and overcrowding in the course of his journey than is the case in England, owing to the extent to which the railways and rolling stock are utilized for military requirements and such urgent traffic as the transportation of foodstuffs to the interior.

Traffic News

The centralization of freight facilities in Buffalo, N. Y., is expected to concentrate l. c. l. traffic in five of the ten freight stations now in use.

Congestion of grain at St. Paul and Minneapolis on Monday last necessitated an embargo on all shipments of grain to Minneapolis. On the tracks of the two cities about 6,000 cars of grain were standing.

The movement of grain eastward over the Grand Trunk during the month of August, mostly from ports on the Great Lakes, for export from Montreal, amounted to 8,371,521 bushels; and the average load per car is given as 1,799 bushels.

At Buffalo, N. Y., on Tuesday, September 11, an embargo was ordered on all grain coming to that city from the west by rail. A heavy movement of wheat from Ohio, Indiana and Michigan was the cause. About 1,600 cars of wheat were waiting in the yards because of congestion on and near the elevator tracks.

A pump weighing five tons was carried recently by automobile from Pittsburgh, Pa., to Norristown, 309 miles, in three days; and the same truck, a Pierce-Arrow, took a similar load back to Pittsburgh in considerably less time. The actual time on the road was about 90 hours, or seven miles an hour. This truck has been in use about twenty months.

The use of motor trucks to carry food products to Philadelphia from the southern part of New Jersey has now become so general that, according to the New Jersey State Department of Agriculture, the number of such trucks in use runs up into the thousands; and, according to the same authority, hundreds of trucks are run from that region every night to New York City.

Railroad companies delivering coal to consumers by order of the Fuel Administration for the purpose of relieving emergencies will be allowed to charge for extra service. The railroad may receive from the consumer or retail dealer the cost of the coal including lawful transportation charges from point of origin to destination, and the additional sum of 15 cents a ton, or such greater additional sum as may be agreed upon by the road and the consumer or dealer. The Bureau of Prices of the Fuel Administration will adjudicate any differences that may occur.

Receipts of grain at the primary markets in the month of August aggregated 166,607,000 bushels, or about 62 million bushels above the best previous record for August, which was four years ago. This record was also about 6 million bushels above that of any single month ever recorded, the previous record being in December, 1915, when the total was 160,444,000. The receipts of wheat in August amounted to 93,164,000 bushels or more than 50 per cent above the largest month's record ever before made, which was in August, 1914.

Director General McAdoo has announced rates on castor bean hulls and stems, c. l. and l. c. l., the same as the rates on fertilizer. Rates on this basis are to be established between points in the state of Florida and other states in Southern Classification Territory. The castor bean industry has become one of considerable importance, owing to the effort of the government to have them produced in large volume, primarily for the purpose of securing oil for use as lubricants for airplanes. The stems and hulls will be used as fertilizer.

Lehigh Valley to Use Pennsylvania Terminals

Director General McAdoo announces that beginning September 15, the New York and Jersey City passenger terminals of the Pennsylvania will be used by the Lehigh Valley, discontinuing the use of the Communipaw terminal of the Central of New Jersey. Lehigh Valley trains Nos. 5, 6, 7, 8, 9, 10, 29, 30, 11 and 28 will run to or from the Pennsylvania station at New York, while the other trains (locals) Nos. 1, 27, 33, 40, 22 and 34, will use the Jersey City terminal of the Pennsylvania. The Lehigh Valley will run its troop trains to or from Communipaw.

A Piece of Freight 13,000 Feet Long

Ocean vessels taking oil from the Tampico fields, Mexico, have to be loaded some distance out from the shore on account of the shallow water and the lack of harbor facilities; and the oil is conveyed from the shore through pipes laid on the bottom of the ocean. At Agua Dulce, about 70 miles south of Tampico, two such pipes have just been laid by the Texas Company, and each pipe is $2\frac{1}{2}$ miles long. Each was drawn from the shore to its position for use by a tug, assisted by a steamship, the sections having been put together on the shore and loaded on a series of four-wheeled trucks, running on rails.

This pipe is 8 in. in diameter and each of the two lines weighs about 382,000 lbs., or as much as one of the large modern freight locomotives. These pipes are more than twice as long as any of those heretofore in use.

At the outer end of these pipe lines connection is made to the tank in the ship by means of flexible metal hose.

Freight-Movement Economy at Philadelphia

The Philadelphia district committee of the car service section of the United States railroad administration has issued regulations for shipment of l. c. l. freight from that city, which fill a book of 400 pages. All l. c. l. freight to the territory lying, in a general way, north and northwest of the city is sent by the Philadelphia & Reading. The Baltimore & Ohio will have for its territory the south and southwest, including the Baltimore and Washington districts and the States south of the Potomac and Ohio rivers. The Pennsylvania will take shipments for what may be broadly described as the middle section of the country. West of Philadelphia this will include the Harrisburg, Pittsburgh and Erie districts, embracing central and western Pennsylvania.

The territory tributary to the numerous freight stations in Philadelphia is divided into fourteen zones. To equalize the service among the different sections of the city the "sailing days" for various specified destinations will be rotated between the various zones. If the l. c. l. freight from the city to a certain destination is sufficient to warrant a car a day, the car will leave each of the zones in turn on different days. Thus the shipper in any given zone will have his choice of waiting until the car comes around to a station in his neighborhood or of teaming his goods across the city to a station in another zone.

Coal Production

The output of bituminous coal during the week ended August 31 was approximately the same as the week preceding, estimated at 12,642,000 net tons as against 12,620,000 net tons during the week of August 24. The production for the week represents an increase of 4.7 per cent over the estimated average daily requirements for the coal year, but production for the first five of the six months of the coal year has been nearly 13,000,000 net tons below the Fuel Administration's schedule of requirements. Production of anthracite during the week is estimated at 2,259,715 net tons, an increase over the week preceding of 5.9 per cent, and making the total production for the coal year an increase of 2.7 per cent. The percentage of full-time output of bituminous for the week ending August 24 lost on account of car shortage is reported as 9.9 per cent.

A report by the Car Service Section of the Railroad Administration shows that the increase in cars of coal loaded for the period from January 1 to August 31, as compared with the corresponding period of 1917, has passed the half million mark. For the week ended August 24 the total cars of all kinds of coal loaded amounted to 263,982, as compared with 229,594 in 1917, and the estimate for the week ending August 31 shows a total of 263,523, as compared with 233,097, making the increase in 1918 up to and including August 31, 516,951 cars.

NORWAY'S FUEL SUPPLY SUFFICIENT.—Commercial Agent Norman L. Anderson, at Copenhagen, Denmark, states that according to press reports Norway's supply of fuel for the winter is secured, 400,000 cords of wood having been carried by the railroads during the first four months of the year. The transportation of wood will be continued all summer.

Commission and Court News

Interstate Commerce Commission

Tentative Report on Time Zones

The Interstate Commerce Commission has issued a tentative report of its attorney-examiner on the Standard Time Zone investigation prescribing the limits of Eastern, Central, Mountain and Pacific standard time zones with regard to the convenience of commerce and the existing junction points and division points of the railroads.

The report says that the preliminary investigation disclosed "a wholly incongruous situation as to the limits of existing time zones" and that they are so irregular as to preclude an attempt to define them even approximately. As the result of the investigation the new lines of demarcation are moved slightly westward in many instances in an effort to approximate the ideal by fixing boundaries between the zones as closely as may be to the median meridians. It is recommended that the changes be made at 2 a. m. on Thanksgiving Day, November 28. The report says the carriers generally asked that the present time-changing points on their lines be not disturbed because they are usually well-established division points and termini of despatching districts but it is held that the "inertia of things as they are should not deprive any portion of the country of the benefits of a well-adjusted time standard."

The proposed new boundary between the Eastern and Central zones would extend from a point on the Canadian boundary near Port Huron, Mich., and south through the St. Clair River, the Detroit River and Lake Erie to Toledo. Thence it passes through Crestline, Columbus and Gallipolis, Ohio; Kenova, W. Va.; Bristol and Johnson City, Tenn.; Franklin, N. C.; Atlanta and Macon, Ga., to Appalachicola Bay, Fla.

Between the Central and Mountain zones the proposed line runs from Portal, N. D.; south along the Missouri River to a point near Pierre, S. D.; thence southwest to the White River and thence to the Nebraska-South Dakota State line; through Nebraska along the Nebraska and Republican rivers to Kansas, near Phillipsburg, detouring west to Dodge City and back to Mineola, using the boundary line of the State to the Cimarron River, which it would follow into Oklahoma, moving generally westward to Collingsworth county, Texas, and thence southwest to the Rio Grande.

The proposed boundary between Mountain and Pacific zones would begin at the east line of the Blackfeet Indian reservation and run south through Cut Bank, Helena and Butte, Mont.; Pocatello, Idaho; Ogden and Salt Lake City, Utah, and west to the Utah-Nevada boundary, which it would follow from a point near Uvada to enter Arizona through Yavapai County, to Seligman and down the Colorado River to the Mexican border.

The act provides that the standard time of Alaska shall be that of the 150th meridian, although the report suggests that it might be expected that Alaska would lie in three zones.

Certain exceptions are made whereby certain carriers are permitted to carry their general time standards over into another zone.

Personnel of Commissions

John M. Jones, chief of the tariff bureau of the Interstate Commerce Commission, died at Washington September 7. Mr. Jones was in railroad service from 1886 until about 11 years ago, when he resigned his position as chief of the tariff bureau of the Southern Railway, at Atlanta, Ga., to take a place with the Interstate Commerce Commission. He began his railroad service in the accounting department of the Richmond & Danville, now a part of the Southern Railway. He served successively on the Georgia & Pacific, the Georgia & Alabama, the Tennessee Central and the Southern. Besides being chief of the division of tariffs under the Interstate Commerce Commission, he was a member of a number of important internal committees of the commission.

Equipment and Supplies

Freight Cars

THE LUCEY MANUFACTURING COMPANY is inquiring for flat cars for export to Japan.

THE BIRMINGHAM PACKING COMPANY, Birmingham, Ala., is inquiring for 10 refrigerator cars.

Iron and Steel

THE DENVER & RIO GRANDE has ordered eight truss bridges weighing 1,050 tons from the Virginia Bridge & Iron Company.

Miscellaneous

THE BAY CITY FOUNDRY & MACHINE COMPANY, Bay City, Mich., is inquiring for 20 sets of pile drivers.

ALASKA ENGINEERING COMMISSION.—Sealed proposals will be received by the Alaska Engineering Commission at Seattle, Wash., by September 23, for iron and steel tools and tin shop supplies, castings and repair parts for locomotives.

Signaling

THE ERIE has ordered from the T. George Stiles Company of Arlington, N. J., one set of standard type "T," 64-way drawbridge circuit controllers for use at Cleveland, Ohio.

THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC has awarded a contract to the Union Switch & Signal Company for the installation of light signals with continuous track circuits on its double-track line between Naval Academy Junction and District Line, near Washington, D. C.

THE NORTHERN TEXAS TRACTION COMPANY has ordered the necessary signal material from the Union Switch & Signal Company to extend the automatic block signals on its line between Ft. Worth, Tex., and Dallas. The extension will include six blocks operating under the "traffic direction block" system, one block for complete curve protection on single track and four blocks of double track signaling for rear-end and curve protection. Thirty new style "N" light signals will be used. The installation will be made by railroad forces.

THE PHILADELPHIA & READING has awarded a contract to the Union Switch & Signal Company for the installation of automatic block signals on its main line from Bound Brook, N. J., to Skillman, 14 miles. The work embraces the substitution of semaphores for the existing enclosed disk signals and will include a new interlocking plant at Manville Junction, N. J., and changes in the interlocking plants at Bound Brook Junction, Belle Mead, and at Manville Crossing. The signals will be operated by alternating current. The Union Switch & Signal Company has received another contract from the Philadelphia & Reading for extensive additions to an electro-pneumatic push button installation at Rutherford (Pa.) yard.

RAILWAY CONSTRUCTION IN ECUADOR.—The Koppel contract with the Ecuadorian Government for the construction of the Huigra-Cuenca Railway has expired and the government is now free to proceed with the construction of the spur from Sibamba to Cuenca. The contract, which was made with the Koppel Co., a Berlin firm, called for a branch line of 150 kilometers (93 miles) to connect with the Guayaquil and Quito line at Sibamba. According to a recent issue of the Guayaquil El Telegrafo, the work done by the Koppel firm was inferior, and great satisfaction is felt that the matter is now out of their hands.—Commerce Reports.

THIS IS A REMINDER that the Fourth Liberty Loan Campaign will begin on September 28 and close October 19.

Supply Trade News

H. W. McCandless, vice-president of the Weir Frog Company, Cincinnati, Ohio, died on August 21.

Harry E. Passmore, formerly with the Grip Nut Company, has accepted a position as production manager with the Marble Cliff Quarries Company, Columbus, Ohio.

James A. Trainor, formerly assistant to the sales manager of the Baldwin Locomotive Works, has been appointed assistant general sales manager of the American Flexible Bolt Company, with offices at 50 Church street, New York. Mr. Trainor started his business life with the Baldwin Locomotive Works and worked his way up through various departments to the position of assistant to the sales manager. In November, 1917, he entered the service of the U. S. Government as a major in the Russian Railway Service Corps. This organization was sent to Russia to operate the Trans-Siberian Railway. Owing to the upheaval in Russia, part of this organization was recalled to the



J. A. Trainor

United States and Mr. Trainor again entered the service of the Baldwin Locomotive Works, resuming his position as assistant to sales manager, which position he held at the time of his recent appointment.

R. S. Brown, whose election to the position of vice-president of the G. M. Basford Company, was recently announced in these columns, has been with that company since its formation about two years ago. Mr. Brown was born in England, but came to this country in early life. He received his early education in the public schools of East Rutherford, N. J. After completing high school he went to Pratt Institute, Brooklyn, where he was graduated in 1909. On graduation he entered the service of the Erie Railroad as a special apprentice, working successively in the Meadville office of the mechanical engineer, in the Erie shops at Susquehanna, the office of the general mechanical superintendent



R. S. Brown

at New York and the office of the purchasing agent at New York. On the formation of the G. M. Basford Company, Mr. Brown went with the new company as above noted.

The American Flexible Bolt Company of Pittsburgh has opened a branch office at Cleveland, Ohio, in charge of L. W. Widmeier, who was formerly assistant general sales manager at the company's New York office.

Fred Preston, formerly manager of sales of the P. & M. Company, Chicago, and last fall commissioned a captain in the Signal

Corps of the United States Army with the Aircraft Production Board in France, has been promoted to the rank of major.

The Bettendorf Company announces the closing of its present sales office in Chicago and New York, effective September 1. Requests or communications to the company should be referred to the home office at Bettendorf, Iowa.

J. C. Weedon has been appointed railroad representative for the Anchor Packing Company, with headquarters at Chicago, to succeed **J. A. McNulty**, resigned to become master mechanic of the Chicago, Milwaukee & St. Paul at Dubuque, Iowa.

American Locomotive Company

An increase of nearly one-half in the charges for taxes on profits was the principal factor in reducing the earnings of the American Locomotive Company in its fiscal year ended June 30, last. The net profits available for distribution to the common stockholders, after the payment of the usual 7 per cent dividend on preferred stock, amounted to \$4,161,137, \$16.64 a share, as compared with \$5,451,680, or \$21.80 a share in the preceding year. The gross earnings for the year ended June 30, 1918, were \$80,588,071, as compared with \$82,213,845 in 1917. The decrease in manufacturing, maintenance and administrative expenses and depreciation, however, was greater than the decrease in gross earnings, so that the manufacturing profit of \$10,229,505 in 1918 represented an increase of \$630,314 over 1917. Deducted from this there was a charge for taxes of \$4,018,951, as compared with only \$2,205,318 in 1917. The usual dividends on the preferred stock were paid and the dividends on the common of 5 per cent, the only difference between the dividends between this year and last being the one per cent Red Cross dividend paid last year. The surplus, after the payment of dividends, amounted to \$2,911,137, as compared with \$3,951,697 in 1917. A charge of \$1,000,000 was made for additions and betterments, as against \$2,000,000 in 1917, so that the net credit to profit and loss, amounting to \$1,911,137, was practically the same as in 1917.

President Fletcher, of the company, said in his annual report that the net profits of the year, amounting to \$9,980,088, included \$893,811 obtained from munitions business, the remaining profit being derived from the regular locomotive business. The final deliveries of munitions were made from the Montreal and Richmond plants in July, 1917, and the work of restoring these plants for locomotive manufacture was practically completed during October, 1917, since which time all the plants of the company have been engaged exclusively on locomotive production. The cost of restoring the Richmond and Montreal plants has been charged to a reserve created for this purpose out of previous years' profits.

The deduction of \$4,018,951 for taxes fully provides for all income and war profits taxes computed in accordance with the existing laws of the United States and Canada, and also includes \$1,400,000 for anticipated increases in the United States war income and excess profits taxes for the six months ended June 30, 1918, which may become effective as of January 1, 1918, upon the passage of the new war revenue law now pending in Congress.

"In arriving at the net profits for the year, there has been included, under the head of manufacturing expenses and deducted from earnings, the sum of \$1,554,613 for depreciation on all classes of property. In addition to this regular yearly depreciation charge, the drawings and patterns account has been written down upon the books of the company to \$1. This charge, amounting to \$981,192, is also included under the head of manufacturing expenses and deducted from the year's earnings.

"During the year there was expended and charged against the reserve for additions and betterments, created out of previous years' earnings, \$3,131,249, which included the purchase of a steel-casting plant at Chester, Pa.; also the cost of additions and improvements to the several locomotive plants of the company.

"In addition to the improvements and additions above mentioned, the company, in June of this year, bought the former plant of the Kline Motor Car Corporation at Richmond, Va., and this plant is now being equipped for the manufacture of important locomotive specialties and accessories heretofore largely purchased from other manufacturers.

"The company sold during the year, to the United States

Rubber Company, the plant at Providence, R. I., formerly used for the manufacture of automobiles, and subsequently as a fuse-loading plant, and sold to the Amoskeag Manufacturing Company the old locomotive plant at Manchester, N. H. Both plants had been previously dismantled and their value written down to a small amount on the books of the company."

Mr. Fletcher notes that the company has received an order for 800 locomotives from the Railroad Administration, and then says:

"The plants of all the locomotive builders of this country will be taxed to their maximum capacity during the war and probably for some time thereafter, to supply the requirements of the railroads operated by the United States Railroad Administration, industrial plants engaged in manufacturing war essentials, and to meet the demands of our government and its Allies for foreign service.

"It is believed that the standardizing of locomotive design for domestic railroads will be a substantial factor in obtaining maximum tonnage production from the plants of the various builders.

"A scarcity and a general unrest of both skilled and unskilled labor existed during the year notwithstanding frequent increases of wages; these conditions still exist, and, together with the enlistment and draft of men required for national service, the severe weather conditions of last winter, and the then congestion of rail traffic with consequent delays in obtaining materials, and the shortage of fuel, affected the production for the year.

"The amount of money in inventories of materials and supplies on hand and for work in progress as of June 30, 1918, aggregated \$25,411,835, as compared with about \$11,000,000 in the largest year of business previous to the war. This very large increase is due to the higher costs of materials and supplies, the necessity for having on hand a larger stock because of the uncertainty of obtaining promptly materials and supplies as they are required, and to the great increase in cost of all labor employed. . . .

"The amount of unfilled locomotive orders in the books on June 30, 1918, was \$74,736,543, as compared with \$77,620,449 on June 30, 1917."

The consolidated general balance sheet follows:

	LIABILITIES
Capital stock—	
Preferred	\$25,000,000
Common	25,000,000
	<u>\$50,000,000</u>
Bonded debt of constituent companies.....	1,957,000
Current liabilities—	
Advance payments received on contracts.....	\$299,310
Accounts payable	6,459,126
Unclaimed interest and dividends.....	2,897
Loans payable—account of Third Liberty Loan Bonds	1,279,000
Other loans payable.....	6,000,000
Sundry accrued expenses, including accruals for United States and Canadian income and war taxes	4,899,699
Dividend on preferred stock payable July 22, 1918	437,500
Dividend on common stock payable July 3, 1918	312,500
	<u>19,690,032</u>
Reserve for accident indemnity and miscellaneous items.....	477,656
Reserve for additions and betterments.....	1,591,348
Profit and loss.....	17,828,507
	<u>\$91,544,543</u>
	ASSETS
Cost of property (less depreciation reserves).....	\$44,773,481
Sundry securities owned.....	643,453
Current assets—	
Cash on hand and in banks.....	\$2,709,397
Accounts and bills receivable.....	16,590,892
Employees' subscription for United States Liberty Loan Bonds (less instalment payments)..	749,516
Employees' subscription for Canadian Victory Loan Bonds (less instalment payments).....	20,981
United States Liberty Loan Bonds.....	503,250
Accrued interest	4,836
Materials and supplies.....	11,637,472
Contract work in course of construction.....	13,649,148
Locomotives and parts in stock.....	125,215
	<u>45,990,707</u>
Sundry deferred charges.....	136,902
	<u>\$91,544,543</u>

Trade Publications

PISTON RINGS.—Ever-Tite piston rings, which are claimed to increase compression and power and reduce waste of fuel and oil, are described and illustrated in a four-page folder issued by the Ever Tight Piston Ring Company, St. Louis, Mo. The prices and dimensions are given in the pamphlet.

Railway Financial News

BOSTON & MAINE.—A plan for the rehabilitation of this railroad with the aid of a loan of \$20,000,000 from the Railroad Administration was announced by Director General McAdoo, while on a tour of inspection of New England roads. Interest on the money advanced to the Boston & Maine, the direct general said, would be secured by mortgage bonds and trust funds, and the approval of substantially all of the stockholders would be necessary before the plan could be put into effect.

BUFFALO, ROCHESTER & PITTSBURGH.—This company has filed a petition with the New York Public Service Commission, Second District, for authority to execute an agreement with the Central Union Trust Company of New York, under which the railroad will issue \$1,200,000 in equipment bonds. The company proposes to use the proceeds of the bonds in buying rolling stock, which will be leased to the company by the trustees, the equipment to become the property of the road when the bonds are paid. The railroad has arranged with the United States Railroad Administration for the purchase of the bonds at par.

CHICAGO, ROCK ISLAND & PACIFIC.—See editorial comments elsewhere in this issue.

CHICAGO & WESTERN INDIANA.—This company had \$15,000,000 6 per cent notes which matured September 1 and which were defaulted. These notes were sold a year ago by a syndicate headed by J. P. Morgan & Co. An exchange of letters and telegrams took place between the Morgan firm and John Skelton Williams, director of the Division of Finance, of the Railroad Administration which, so far as has been made public to the date of going to press, amounted in substance to a request on the part of Mr. Williams for the Morgan firm to, in some way, assure the renewal of the notes on a 6 per cent basis, and the offer of Morgan & Company to renew the notes on condition that the rentals from which the Chicago & Western Indiana receives its income would be guaranteed by the government, at a total cost, including interest charges, underwriting, and bankers' commissions of 9½ per cent. This offer was rejected by Mr. Williams who again demanded renewal of the notes on a 6 per cent basis and Morgan & Company replied that they would offer holders of the old notes new Chicago & Western Indiana 6 per cent notes without any bankers' commissions or charges for expenses, but would not guarantee that these notes would all be taken by the holders of the old notes. Mr. Williams offered to advance money enough to pay off such notes as did not accept renewal on condition that this money should only be advanced for 60 days and that Morgan & Company and their associates should arrange to carry the financing of these unrenewed notes after 60 days. This proposition Morgan & Company refused to concede to, claiming that the notes could not be sold at such a price.

DENVER & RIO GRANDE.—See Western Pacific.

GRAND TRUNK.—Lord Southborough, better known as Sir Francis Hopwood, has been elected a director to succeed the late Col. Frederick Firebrace.

A cable from London dated September 10, states that the Grand Trunk is floating new issue of \$15,000,000 three-year 6 per cent notes at 99 for the purpose in part of redeeming \$10,000,000 5 per cent notes maturing October 1.

WESTERN PACIFIC.—The Equitable Trust Company, as trustee for the first mortgage bonds of the Western Pacific, in a report issued on Tuesday, announced that \$7,771,395 had been realized upon the judgment of approximately \$38,000,000 against the Denver & Rio Grande, obtained because of the latter company's failure to live up to its guarantee of the interest on the bonds. Among the assets of the Denver company sold under the judgment was its equity in the Utah Fuel Company, which brought \$4,000,000. In order to purchase this equity the Western Pacific borrowed the sum required, which loan, it is supposed, will be paid off.

Railway Officers

Railroad Administration General

E. H. Lamb, of the Northwestern regional director's staff, and formerly general agent of the Chicago & North Western, at Sacramento, Cal., has been appointed representative of the Northwestern region on Bureau of Suggestions, Complaints and Public Relations of the United States Railroad Administration, with headquarters at Washington, D. C.

Regional

Hugh McVeagh has been appointed executive assistant and **P. L. McManus** has been appointed transportation assistant to H. A. Worcester, district director of the Ohio-Indiana district, both with headquarters at Cincinnati, Ohio.

Federal and General Managers

H. A. Whittenberger, general manager of the Grand Trunk, Western Lines, has moved his headquarters from Chicago to Detroit, Mich.

F. R. Bolles, vice-president and general manager of the Copper Range, has been appointed general manager, with headquarters at Houghton, Mich.

The Galveston Wharf Company was placed under federal control on August 1, and added to the jurisdiction of **W. B. Scott**, federal manager, Houston, Tex.

J. S. Peter, general manager of the San Antonio & Aransas Pass, has had his jurisdiction extended over the San Antonio, Uvalde & Gulf, with headquarters at San Antonio, Tex.

S. G. Strickland, federal manager of the Chicago & North Western, has had his jurisdiction extended over the Fort Dodge, Des Moines & Southern and the Waterloo, Cedar Falls & Northern, effective September 1.

F. B. Seymour, general manager of the Green Bay & Western, and receiver and treasurer of the Waupaca-Green Bay, has been appointed general manager of the Green Bay & Western, the Kewanee, Green Bay & Western, the Ahnapee & Western and the Waupaca-Green Bay, with headquarters at Green Bay, Wis.

Operating

Gordon P. McHenry has been appointed assistant trainmaster, of the Pittsburgh & Shawmut, with headquarters at Brookville, Pa.

G. H. Gilmer has been appointed superintendent of the Interstate Railroad with headquarters at Appalachia, Va., vice **W. A. Johnson**, resigned.

R. B. Williams, Jr., president of the Central New York Southern, has been appointed general superintendent, with headquarters at Ithaca, N. Y.

D. B. Daley has been appointed superintendent of safety for all lines under the jurisdiction of **J. A. Edson**, federal manager, with headquarters at Kansas City, Mo.

C. S. Darrach, superintendent of the St. Louis & Belleville Electric, has been appointed also superintendent of the St. Louis & O'Fallon, with headquarters at St. Louis, Mo.

E. E. Nash, assistant to federal manager of the Chicago & North Western, at Chicago, has been appointed to the same position on the Fort Dodge, Des Moines & Southern.

P. F. McManus, general superintendent of the Elgin, Joliet & Eastern, with office at Joliet, Ill., has been appointed general superintendent also of the Chicago, Milwaukee & Gary.

Edward Bodamer, trainmaster on the Yazoo & Mississippi Valley at Memphis, Tenn., has been promoted to superin-

tendent of terminals at that city, succeeding **S. J. Hays**, resigned.

A. F. Page, chief despatcher on the Illinois Central at Louisville, Ky., has been promoted to trainmaster, with headquarters at Louisville, to succeed **G. B. James**, retired on a pension.

F. L. Lewis, general superintendent of the San Antonio, Uvalde & Gulf, has been appointed assistant superintendent of transportation under federal control, with headquarters at North Pleasanton, Tex.

G. B. Goodloe, superintendent of transportation of the San Antonio & Aransas Pass, has been appointed assistant superintendent of transportation under federal control, with headquarters at San Antonio, Tex.

L. Podesta, superintendent of the Chicago Junction, has been appointed superintendent of the Chicago Junction and the Chicago River & Indiana, effective September 1, with office at Union Stock Yards, Chicago.

W. H. Fogg, general superintendent of the Chicago, Indianapolis & Louisville, has been appointed superintendent of transportation under Federal control, with headquarters at Lafayette, Ind., effective September 1.

H. V. Platt, terminal manager of the Salt Lake (Utah) switching district and Ogden switching district, has been appointed also general manager of the Ogden Union Railway & Depot, with headquarters at Salt Lake, Utah.

C. H. Smith, superintendent of the Green Bay & Western, has been appointed superintendent also of the Kewanee, Green Bay & Western, the Ahnapee & Western and the Waupaca-Green Bay, with office at Green Bay, Wis.

J. H. Dyer, assistant general manager of the northern district of the Southern Pacific, with headquarters at Portland, Ore., has been promoted to general manager in charge of the Southern Pacific-Pacific System Lines south of Ashland, Ore., the Western Pacific, the Tidewater Southern and the Deep Creek Railroad, with headquarters at San Francisco, Cal. Mr. Dyer was born at Colfax, Cal., in 1872, and began work with the Southern Pacific as a track laborer in 1888 on the Sacramento division. He was subsequently brakeman, conductor, yardmaster and trainmaster on the same division. In 1908 he was appointed superintendent of the Shasta division and in 1911 was transferred to the Tucson division. He was again transferred to the Sacramento division in 1914, and on July 1, 1916, was appointed assistant general manager at Portland.

F. L. Burckhalter, division superintendent of the Southern Pacific Company at Portland, Ore., has been appointed assistant general manager of the northern district, south of Ashland, and **T. H. William**, division superintendent of the Southern Pacific Company, at Oakland Pier, Cal., has been appointed assistant general manager of the Southern district, south of Ashland.

Daniel E. Rossiter, whose appointment as division superintendent on the Chicago, Milwaukee & St. Paul, with office at Portage, Wis., was announced in the *Railway Age* of August 23, was born at Orfordsville, Wis., and entered railway service with the St. Paul, in 1895. He has been continuously in the employ of that road ever since. In the first eight years of service he was agent and operator; from 1903 to 1908, train despatcher; from the latter date to 1912, chief despatcher; and from 1912, to August 15, 1918, trainmaster.

Edgar J. Hamner has been appointed superintendent of the New York Terminals of the Baltimore & Ohio; the Baltimore & New York, and the Staten Island Rapid Transit, with headquarters at St. George, S. I., N. Y., vice **H. R. Hanlin**, transferred, and **William B. Biggs** has been appointed terminal agent of the New York Terminals, with headquarters at New York.

E. A. Blake, acting general superintendent of the eastern general division of the Norfolk & Western, with office at Roanoke, Va., has been appointed general superintendent of the eastern general division, with office at Roanoke, vice **V. A. Ritton**, assigned to other duties. **D. F. Peters**, trainmaster at Crewe, has been appointed superintendent of the Norfolk division, with office at Crewe, vice Mr. Blake.

The jurisdiction of the following Southern Pacific officers has been extended over the Western Pacific, the Tidewater Southern, and the Deep Creek: **A. Pollok**, superintendent of dining cars, hotels and restaurants; **R. L. Ruby**, acting superintendent of transportation; **E. L. King**, superintendent of telegraph; **A. L. Hayden**, contract agent, and **P. J. Kindelon**, chief special agent; all with headquarters at San Francisco, Cal.

W. H. Strachan, division superintendent of the Northern Pacific, at Duluth, Minn., has been appointed terminal manager of the Duluth-Superior terminals, with headquarters at Duluth, effective September 5. As terminal manager he will have charge of all terminal operations in Duluth, Minn., and Superior, Wis., in a district extending east to and including Itasca, Wis., and west to Fond du Lac, Minn. He will report to the manager of ore, coal and grain traffic of Lake Superior and upper Lake Michigan ports.

F. M. Lucore, assistant general manager of the Southern Pacific, Texas Lines, has been appointed superintendent of transportation, with headquarters at Houston, Tex., of all lines under the jurisdiction of W. B. Scott, federal manager, namely Morgan's Louisiana & Texas, the Louisiana Western, the Texas & New Orleans, the Galveston, Harrisburg & San Antonio, the New Orleans, Texas & Mexico, the Beaumont, Sour Lake & Western, the St. Louis, Brownsville & Mexico, the San Antonio & Aransas Pass and the San Antonio, Uvalde & Gulf. **F. W. Parker**, superintendent of transportation of the Gulf Coast Lines, has been appointed superintendent of car service of all lines under the jurisdiction of W. B. Scott, federal manager, with headquarters at Houston, Tex. **O. C. Castle**, formerly superintendent of car service of the Southern Pacific, Texas Lines, is now with the Car Service Section of the Railroad Administration at Washington. **D. C. P. Hewitt**, superintendent of telegraph of the Southern Pacific, Texas Lines, has been appointed superintendent of telegraph of all lines under W. B. Scott, federal manager, with headquarters at Houston, Tex. **H. L. Bennett**, superintendent of telegraph of the Southern Pacific, Texas Lines, has been appointed assistant superintendent of telegraph of all lines under the authority of W. B. Scott, federal manager, with headquarters at Houston. **E. B. Coombs**, assistant superintendent of dining cars of the Southern Pacific, Texas Lines, has been appointed superintendent of dining cars, hotels and restaurants of all lines under W. B. Scott, federal manager, with headquarters at Houston. **H. M. Mayo** has been appointed superintendent of safety, and **C. L. MacManus** has been appointed supervisor of station service of all lines under the authority of W. B. Scott, federal manager, with headquarters at Houston.

The Stockton division of the Southern Pacific is now a part of the Northern district, the Portland division having been assigned to **J. P. O'Brien**, federal manager at Portland, Ore.; **B. McIntyre**, assistant to vice-president and general manager of the Southern Pacific Company, at San Francisco, Cal., has been appointed assistant to general manager in charge of wage schedules; **J. F. Spelman**, general superintendent of the Western Pacific, at San Francisco, Cal., has been appointed also general superintendent of the main line and Fernley branch, Southern Pacific, Salt Lake division; **T. F. Rowlands** has been appointed superintendent of the Southern Pacific, western division, at Oakland Pier, succeeding **T. H. Williams**, promoted, and also superintendent of the Oakland, Alameda & Berkeley Electric lines, succeeding



J. H. Dyer

J. C. McPherson, who has received a commission as captain in the engineering corps of the United States army; **B. A. Campbell**, assistant division superintendent at Ogden, Utah, has been promoted to superintendent of the Stockton division of the Southern Pacific, with office at Stockton, succeeding **H. B. Titcomb**, resigned to enter the service of another company; **E. Entleman**, trainmaster at Los Angeles of the Southern Pacific, has been appointed assistant superintendent of the Western division, with headquarters at Oakland Pier, succeeding **G. E. Gaylord**, promoted; **H. W. Wistner**, trainmaster of the Southern Pacific at Ogden, has been appointed assistant superintendent of the Salt Lake division; **W. L. Hack** has been appointed assistant superintendent of the Southern Pacific, Sacramento division, at Sacramento, succeeding **W. H. Kirkbride**, promoted; **W. B. Kirkland**, trainmaster of the Southern Pacific, at Dunsmuir, Cal., has been appointed assistant superintendent of the Shasta division, with the same headquarters, succeeding **A. T. Mercier**, promoted; **H. G. McCarthy** has been appointed trainmaster of the Shasta division, with office at Dunsmuir; **C. G. Tandy** has been appointed trainmaster of the San Joaquin division of the Southern Pacific, with office at Fresno, Cal., succeeding **F. N. McPhee**, who is now in military service; **V. S. Andrus** has been appointed trainmaster of the Southern Pacific, Salt Lake division, with office at Mina, Nev., succeeding **F. F. Small** transferred to Sparks, Nev., succeeding **W. H. McBean**, who has been transferred to Ogden, Utah; **E. J. Kellum** has been appointed trainmaster of the Shasta division of the Southern Pacific, with office at Dunsmuir.

Financial, Legal and Accounting

H. P. McMillan, auditor of the San Antonio, Uvalde & Gulf, has been appointed auditor and acting federal treasurer, with headquarters at San Antonio, Tex.

W. F. Wright, assistant to the purchasing agent of the Louisiana & Arkansas, has been appointed federal treasurer, with headquarters at Texarkana, Ark., succeeding **F. S. Carroll**, resigned, effective September 1.

G. H. Westcott, traffic manager of the Copper Range, has been appointed general freight and passenger agent and acting federal treasurer; **J. G. Stone** has been appointed general solicitor, and **C. E. Wright** has been appointed federal auditor, all with headquarters at Houghton, Mich.

The firm of Glennon, Cary & Walker, Chicago, have been appointed general solicitors of the Indiana Harbor Belt; **W. E. Osborn**, general auditor, has been appointed federal auditor, and **H. A. McConnell** has been appointed acting federal treasurer; both with offices at Gibson, Ind.

Appointments have been made on the Fort Dodge, Des Moines & Southern, effective September 1, as follows: **S. R. Dyer** has been appointed general solicitor, with office at Boone, Iowa; **F. W. Johnston**, treasurer and auditor, has been appointed federal treasurer, with office at Boone.

H. T. Evans, auditor of the Chicago, Indianapolis & Louisville, has been appointed general auditor under Federal control, with headquarters at Chicago. **Byron Cassell**, treasurer of the Chicago, Indianapolis & Louisville, has been appointed acting federal treasurer, with headquarters at Chicago.

J. F. Evans, general auditor of the Western Pacific, at San Francisco, Cal., has been appointed general auditor of the Western Pacific, the Tidewater Southern, and the Deep Creek, and **Charles Elsey**, treasurer of the Western Pacific at San Francisco, has been appointed acting federal treasurer of the same road.

T. O. Edwards, assistant secretary and auditor of the Southern Pacific, at San Francisco, Cal., has been appointed general auditor of the Southern Pacific system, lines south of Ashland, Ore., and **W. F. Ingram**, assistant treasurer at San Francisco, has been appointed acting federal treasurer of the same lines.

H. D. Sheean, general attorney of the Baltimore & Ohio Chicago Terminal, has been appointed general solicitor; **F. B. Huntington**, auditor, has been appointed federal auditor,

and **H. H. Hall**, assistant secretary and assistant treasurer, has been appointed acting federal treasurer; all with headquarters at Chicago.

H. O. Fairchild has been appointed general solicitor, **J. C. Thurman** has been appointed federal auditor, and **Arthur H. Nongin** has been appointed acting federal treasurer, of the Green Bay & Western, the Kewanee, Green Bay & Western, the Ahnapee & Western, and the Waupaca-Green Bay; all with headquarters at Green Bay, Wis.

B. F. James, secretary and treasurer of the Colorado & Southern, has been appointed acting federal treasurer of that road and of the Denver & Salt Lake, with headquarters at Denver, Colo. **E. I. Grenfell**, general auditor of Denver & Salt Lake, has had his jurisdiction extended over the Colorado & Southern, with headquarters at Denver, Colo.

J. D. Black has been appointed general solicitor of the Chicago Junction and the Chicago River & Indiana, with office at Chicago, and **E. S. Gentle**, has been appointed federal auditor; **F. D. O'Connor**, assistant secretary and assistant treasurer of the Union Stock Yards & Transit Company, has been appointed acting federal treasurer of both of the above roads.

Appointments have been made on the Chicago & Western Indiana and the Belt Railroad of Chicago, effective September 1, as follows: **J. R. Barse** has been appointed general solicitor, succeeding **C. G. Austin**; **R. L. Porter**, auditor and assistant secretary of the Chicago & Western Indiana and secretary and auditor of the Belt Railroad of Chicago, has been appointed federal auditor, of both roads, and **J. E. Murphy**, treasurer of both roads, has been appointed acting federal treasurer of both roads, all with headquarters at Chicago.

K. K. Knapp, general counsel of the Elgin, Joliet & Eastern, has been appointed to the same position on the Chicago, Milwaukee & Gary, and **R. W. Campbell**, general attorney, has been appointed general solicitor; both with offices at Chicago. **C. G. Nelson**, secretary, treasurer and auditor of the Chicago, Milwaukee & Gary, has been appointed federal auditor of the same road; **F. W. Winkler**, assistant auditor of the Chicago, Milwaukee & Gary, has been appointed acting federal treasurer of the same road, with office at Rockford, Ill.; **G. W. Williams** has been appointed federal auditor of the Elgin, Joliet & Eastern, with office at Chicago; **F. L. Koontz**, secretary and treasurer of the Elgin, Joliet & Eastern, has been appointed federal treasurer, with office at Chicago, effective September 1.

Traffic

M. J. Dooley has been appointed division freight and passenger agent, of the Houston East & West Texas, with headquarters at Houston, Tex.

W. L. Lewis, traffic manager of the Elgin, Joliet & Eastern, at Chicago, has been appointed traffic manager also of the Chicago, Milwaukee & Gary.

A. H. VanLoan has been appointed division freight agent in charge of traffic at Shreveport, La., and of the Vicksburg, Shreveport & Pacific, with office at Shreveport, La.

Eugene Mock, traffic manager of the Midland Valley at Muskogee, Okla., has been appointed division freight and passenger agent, with headquarters at the same place.

E. H. Shauffer, general traffic manager of the Kansas City, Mexico & Orient, at Kansas City, Mo., has been appointed division freight and passenger agent, with headquarters at Wichita, Kan.

H. K. Faye, traffic manager of the Western Pacific, has been appointed general freight and passenger agent of that road, the Tidewater Southern and the Deep Creek, with headquarters at San Francisco, Cal.

W. G. Crush, general passenger agent of the Missouri, Kansas & Texas Railway of Texas, has been appointed general passenger agent of that road, the Houston & Texas Central and the Union Terminal of Dallas, with headquarters at Dallas, Tex., effective September 1.

The jurisdiction of **E. B. Carson**, general baggage agent of the Southern Pacific, with office at San Francisco, Cal., has been extended over the Western Pacific; the Tidewater Southern, and the Deep Creek.

J. F. Garvin, general freight agent of the Missouri, Kansas & Texas Railway of Texas, has been appointed general freight agent of that road, and the Wichita Falls & Northwestern, with headquarters at Dallas, Tex., effective September 1.

W. S. Keenan, general passenger agent of the Gulf, Colorado & Santa Fe lines, has been appointed also general passenger agent of the Texas Midland and the Houston Belt & Terminal, with headquarters at Galveston, Tex., effective September 1.

F. R. Dalzell, assistant general freight agent of the Gulf, Colorado & Santa Fe lines, has been appointed also assistant general freight agent of the Texas Midland and the Houston Belt & Terminal, with headquarters at Galveston, Tex., effective September 1.

J. B. Call, general freight and passenger agent of the Green Bay & Western, has been appointed general freight and passenger agent also of the Kewanee, Green Bay & Western, the Ahnapee & Western, and the Waupaca-Green Bay, with office at Green Bay, Wis.

J. S. Hershey, general freight agent of the Gulf, Colorado & Santa Fe lines, with headquarters at Galveston, Tex., has been appointed also general freight agent of the Texas Midland and the Houston Belt & Terminal, with headquarters at Galveston, effective September 1.

G. W. Luce, freight traffic manager of the Southern Pacific Company, at San Francisco, Cal., has been appointed freight traffic manager of the Southern Pacific system, lines south of Ashland, Ore., the Western Pacific, the Tidewater Southern and the Deep Creek; **Charles S. Fee**, passenger traffic manager of the Southern Pacific Company at San Francisco, has been appointed passenger traffic manager of all the above roads.

W. F. Sterley, general freight and passenger agent of the Ft. Worth & Denver City, at Fort Worth, Tex., has been appointed assistant general freight agent of that road, the Wichita Valley, the Houston & Texas Central, the St. Louis, San Francisco & Texas, the Ft. Worth & Rio Grande, the Brownwood North & South, the International & Great Northern (Ft. Worth to Spring—Madisonville Branch) the Abilene & Southern and the Ft. Worth Belt, with headquarters at Ft. Worth, Tex., effective September 1.

J. A. Brown, general freight agent of the Gulf Coast Lines, with headquarters at Houston, Tex., has been appointed general freight agent of the Ft. Worth & Denver City, the Wichita Valley, the Houston & Texas Central, the St. Louis, San Francisco & Texas, the Ft. Worth & Rio Grande, the Brownwood North & South, the International & Great Northern (Ft. Worth to Spring—Madisonville Branch) the Abilene & Southern and the Ft. Worth Belt, with headquarters at Ft. Worth, Tex., effective September 1.

C. W. Strain, general passenger agent of the Gulf Coast Lines, with headquarters at Houston, Tex., has been appointed general passenger agent of the Ft. Worth & Denver City, the Abilene & Southern, the St. Louis, San Francisco & Texas, the Ft. Worth & Rio Grande, the Brownwood North & South, the International & Great Northern (Ft. Worth to Spring—Madisonville Branch) and the Ft. Worth Union Passenger station, with headquarters at Ft. Worth, Tex., effective September 1.

L. V. Beatty, general agent of the Kansas City Southern, at Kansas City, Mo., has been appointed division freight agent, with headquarters at the same place, and **J. O. Hamilton**, assistant general freight agent, at Texarkana, has been appointed division freight agent of the Kansas City Southern, south of DeQueen, Ark., and of the Texarkana & Fort Smith, with headquarters at Texarkana, Tex. **S. G. Hopkins**, division passenger agent, of the Kansas City Southern, at Texarkana, has been appointed division passenger agent on the Kansas City Southern south of DeQueen, Ark., and of the

Texarkana & Ft. Smith and the Vicksburg, Shreveport & Pacific, with office at Texarkana, Tex.

The following officers of the Kansas City Southern have been appointed to the same or new positions on that road and the Texarkana & Ft. Smith, the Midland Valley, the Houston East and West Texas, the Vicksburg, Shreveport & Pacific, the Kansas City, Mexico & Orient Lines and the Joplin Union Depot, effective September 1: **R. R. Mitchell**, general freight agent, has been appointed to the same position, with headquarters at Kansas City, Mo. **S. G. Warner**, general passenger and ticket agent, has been appointed general passenger agent at Kansas City; **H. A. Weaver**, assistant general freight agent, has been appointed to the same position at Kansas City; **J. R. Mills**, assistant general freight agent, has been appointed to the same position at Kansas City, and **F. D. Downie**, general baggage agent, has been appointed to the same position on all lines, at Kansas City.

The following officers have been appointed to traffic positions on all of the lines under the jurisdiction of **J. S. Pyeatt**, federal manager: **C. O. Jackson**, who has been general passenger agent of the Ft. Worth & Rio Grande and assistant general passenger agent of the Paris & Great Northern, becomes general baggage agent, with headquarters at Dallas, Tex. **R. Daniels**, assistant general passenger agent on the Missouri, Kansas & Texas Railway of Texas, has been appointed division passenger agent, with office at Dallas, Tex. **W. B. Wells**, assistant general freight agent of the Paris & Great Northern and general freight agent of the Ft. Worth & Rio Grande, has been appointed division freight and passenger agent, with headquarters at San Antonio, Tex. Other division freight and passenger agents recently appointed include **H. W. Landman**, who will be located at Ft. Worth, Tex.; **W. H. Yeargin**, with office at Wichita Falls, Tex.; **W. L. Geer**, with headquarters at Waco, Tex., and **G. B. Magruder**, with headquarters at Houston, Tex.

W. A. Kellond, manager of mail traffic and general baggage agent of the Missouri, Kansas & Texas, at Parsons, Kan., has been appointed general baggage agent of that road and of the St. Louis-San Francisco, with headquarters at Springfield, Mo. **J. C. Lovrien**, division passenger agent of the St. Louis-San Francisco at Kansas City, Mo., has had his jurisdiction extended to include the Missouri, Kansas & Texas. **F. J. Deicke**, general agent, passenger department, of the St. Louis-San Francisco at St. Louis, Mo., has been appointed division passenger agent of the Frisco and the Missouri, Kansas & Texas, with the same headquarters. **L. W. Price**, division passenger agent of the Frisco at Oklahoma City, Okla., has been appointed also division passenger agent of the Katy. **F. R. Newman**, division passenger agent of the St. Louis-San Francisco, at Joplin, Mo., has had his jurisdiction extended over the Missouri, Kansas & Texas, with the same headquarters. **H. C. Conley**, assistant general freight agent of the St. Louis-San Francisco, at Oklahoma City, Okla., has been appointed division freight agent of that road and the Missouri, Kansas & Texas, with the same headquarters. **H. B. Sperry**, assistant general freight agent of the Missouri, Kansas & Texas, at Kansas City, Mo., has been appointed division freight agent of that road and the St. Louis-San Francisco, with the same headquarters. **F. J. Lawler**, commercial agent of the Frisco, at St. Louis, Mo., has been appointed division freight agent of that road and the Missouri, Kansas & Texas, with the same headquarters. **A. H. Stevens** has been appointed division freight agent of the Missouri, Kansas & Texas and the St. Louis-San Francisco, at Joplin, Mo. **J. F. Reily**, general freight and ticket agent in Kansas of the Missouri, Kansas & Texas, with headquarters at Parsons, Kan., has been appointed division freight agent of both that road and the St. Louis-San Francisco, with the same headquarters.

C. C. P. Rausch, assistant freight traffic manager of the Missouri Pacific, has been appointed to the same position on the Missouri Pacific, the St. Louis Southwestern and the Louisiana & Arkansas. **B. S. Atkinson**, purchasing agent and traffic manager, of the Louisiana & Arkansas, has been appointed general freight agent of that road with headquarters at Texarkana, Ark. **J. D. Watson**, assistant to the president of the St. Louis Southwestern, has been appointed

assistant general freight agent of that road with headquarters at St. Louis, Mo. **W. M. Cook**, manager of foreign freight traffic, of the Missouri Pacific at St. Louis, has been appointed assistant general freight agent of that road, the St. Louis Southwestern and the Louisiana & Arkansas, with office at St. Louis. **L. D. Knowles**, assistant general freight agent, of the Missouri Pacific at Kansas City, has been appointed division freight agent of that road, with the same headquarters. **R. M. McWilliams**, assistant general freight agent, of the Missouri Pacific at Little Rock, has been appointed division freight agent of that road and the St. Louis Southwestern, with the same headquarters. Dan Jacobs, assistant general freight agent, of the Missouri Pacific at Alexandria, La., has been appointed division freight agent of that road and the Louisiana & Arkansas, with the same headquarters. **J. T. Ferguson**, local representative, agency and public service, of the St. Louis Southwestern at Shreveport, La., has been appointed division freight agent of that road and the Louisiana & Arkansas, with the same headquarters. **F. L. Feakins**, assistant general freight agent of the Missouri Pacific at Omaha, has been appointed division freight agent of that road, with the same headquarters. Other division freight agents of the Missouri Pacific recently appointed include **P. E. Watson**, Pueblo, Col., who was formerly general agent of the Missouri Pacific at that point; **J. D. Yates**, Wichita, Kan., formerly general agent of the Missouri Pacific at that point; **C. C. Cloutman**, Atchison, Kan., formerly general agent of the Missouri Pacific in that city; **G. W. Pither**, Joplin, Mo., formerly commercial agent of the Missouri Pacific at that point, and **N. A. Beach**, St. Joseph, Mo., formerly general agent of the Missouri Pacific at that city. The following division freight agents of the Missouri Pacific and the St. Louis Southwestern have been appointed: **C. C. McCarthy**, St. Louis, Mo., formerly general agent of the Missouri Pacific at that city; **W. D. May**, Memphis, Tenn., formerly local representative, agency and public service, of the St. Louis Southwestern in that city, and **C. B. Lindsay**, Pine Bluff, Ark., formerly division passenger and freight agent of the Missouri Pacific at that city.

Engineering and Rolling Stock

O. H. Gersbach, engineer maintenance of way of the Indiana Harbor Belt, at Gibson, Ind., has been appointed chief engineer.

Raymond A. Greene, formerly a chemist with Armour & Co., Chicago, has been appointed chemist and engineer of tests of the Chicago & Alton, with headquarters at Bloomington, Ill.

G. W. Hegel, chief engineer of the Chicago Junction, has been appointed chief engineer also of the Chicago River & Indiana, with office at Union Stock Yards, Chicago.

A. Montzheimer, chief engineer of the Elgin, Joliet & Eastern, at Joliet, Ill., has been appointed chief engineer also of the Chicago, Milwaukee & Gary, succeeding **I. W. Troxel**.

J. Horrigan, superintendent of motive power of the Elgin, Joliet & Eastern, at Joliet, Ill., has been appointed superintendent of motive power also of the Chicago, Milwaukee & Gary.

E. R. Breaker, chief engineer of the San Antonio, Uvalde & Gulf, has been appointed assistant mechanical superintendent under federal control, with headquarters at North Pleasanton, Tex.

D. M. McLauchlan, assistant master mechanic of the Southern Pacific, at Brooklyn, Ore., has been appointed master mechanic on the Portland division, vice **C. E. Peck** resigned to go to another road.

J. A. McNulty, railroad representative of the Anchor Packing Company, at Chicago, has been appointed division master mechanic of the Chicago, Milwaukee & St. Paul, at Dubuque, Iowa, succeeding **G. T. Messer**.

Willard Kells, assistant general superintendent of motive power of the Atlantic Coast Line, with office at Wilmington, N. C., has been appointed general superintendent of motive

power of the Atlantic Coast Line and the Winston-Salem Southbound, vice **R. E. Smith**, deceased.

R. J. Sporseller has been appointed road foreman of engines on the Pennsylvania Railroad, Western Lines, with headquarters at Lancaster, Ohio, to succeed **J. L. Todhunter**, transferred, effective September 5.

F. E. Morrow, assistant chief engineer of the Chicago & Western Indiana and the Belt Railroad of Chicago, at Chicago, has been appointed chief engineer, succeeding **E. H. Lee**, who goes with the corporation.

T. J. Wyche, chief engineer and chairman of the Valuation Committee of the Western Pacific, at San Francisco, Cal., has been appointed chief engineer of the Western Pacific, the Tidewater Southern, and the Deep Creek.

W. T. Mead, acting group engineer of the western group of the Presidents' Conference Committee, has been appointed assistant valuation engineer of the Illinois Central, with headquarters at Chicago, to succeed **D. W. Thrower**, recently promoted to valuation engineer.

J. M. Silliman, resident engineer of the Canadian Pacific, at London, Ont., has been appointed division engineer in charge of maintenance of way forces on the Susquehanna division of the Delaware & Hudson, with headquarters at Oneonta, N. Y., vice **H. S. Rogers**, resigned.

W. H. Kirkbride, assistant superintendent of the Sacramento division of the Southern Pacific-Pacific System, with headquarters at Sacramento, Cal., has been appointed chief engineer of the Southern Pacific-Pacific System Lines south of Ashland, Ore., with headquarters at San Francisco, Cal., succeeding **W. Hood**, who remains with the corporation. Mr. Kirkbride graduated from Leland Stanford, Jr., University in 1895 and for seven years was engaged in mining engineering, railroad location and construction work. In August, 1902, he entered the service of the Southern Pacific as assistant engineer at Sacramento, where he remained until April, 1904, when he was appointed roadmaster of the Red Bluff district. In February, 1906, he was appointed assistant division engineer of the Sacramento division, and in April, 1909, was promoted to division engineer of the Coast division, with headquarters at San Francisco. He was transferred to the Sacramento division in March, 1911, where he remained until December, 1917, when he was promoted to assistant superintendent.

C. E. Peck, master mechanic of the Southern Pacific, at Brooklyn, Ore., has been appointed assistant superintendent of motive power, of the Oregon-Washington Railroad & Navigation Lines, with headquarters at Portland, Ore., vice **J. T. Langley** resigned to accept service elsewhere.

The jurisdiction of the following Southern Pacific officers has been extended over the Western Pacific, the Tidewater Southern and the Deep Creek: **George McCormick**, superintendent of motive power, and **A. H. Babcock**, electrical engineer; both with headquarters at San Francisco, Cal.

A. Daniels, assistant engineer on concrete construction at Milwaukee, Wis., on the Chicago, Milwaukee & St. Paul, has been promoted to district engineer of the Northern district, with office at Minneapolis, Minn., succeeding **W. R. Powrie**, who has resigned to become superintendent for Morris & Dougherty, contractors, on the Union station at St. Paul.



W. H. Kirkbride

F. L. Carson, superintendent of motive power of the San Antonio & Aransas Pass, has been appointed assistant mechanical superintendent under federal control, with headquarters at Yoakum, Tex. **F. W. Bailey**, superintendent maintenance of way, has been appointed assistant engineer maintenance of way under federal control, with headquarters at Yoakum.

E. G. Lane, engineer maintenance of way of the Baltimore & Ohio, western lines, at Cincinnati, Ohio, has been appointed chief engineer of the Baltimore & Ohio, western lines, the Dayton & Union and the Dayton Union, succeeding **L. G. Curtis** resigned to accept service with the Baltimore & Ohio Railroad Company, and **H. R. Gibson**, district engineer maintenance of way, at Cincinnati, succeeds Mr. Lane.

In the notice of the appointment of **Earl Stimson** as general superintendent of maintenance of way and structures of all lines under the jurisdiction of A. W. Thompson, federal manager at Baltimore, Md., the statement was made that Mr. Stimson graduated from Cornell University in 1895. This statement was incorrect to the extent that while Mr. Stimson attended this university from 1893 to 1895, he did not graduate from it.

J. A. Power, assistant general manager of the Southern Pacific, Texas Lines, has been appointed mechanical superintendent of all lines under the authority of W. B. Scott, federal manager, with headquarters at Houston, Tex. **C. R. Morrill**, assistant general manager of the Southern Pacific, Texas Lines, has been appointed engineer maintenance of way of all lines under W. B. Scott, federal manager, with headquarters at Houston. **E. E. Worthing**, signal engineer of the Southern Pacific, Texas Lines, has been appointed signal engineer of all lines under W. B. Scott, federal manager, with headquarters at Houston.

Purchasing

J. M. Wagner has been appointed purchasing agent of the Copper Range, with headquarters at Houghton, Mich.

William McMaster, purchasing and industrial agent of the Indiana Harbor Belt, at Chicago, has been appointed purchasing agent.

C. H. Kenzel, purchasing agent of the Elgin, Joliet & Eastern, at Chicago, has been appointed purchasing agent also of the Chicago, Milwaukee & Gary.

H. C. Robinson has been appointed purchasing agent of the Chicago Junction and the Chicago River & Indiana, with office at Union Stock Yards, Chicago, succeeding **S. Salter**.

W. C. Weldon, purchasing agent of the Colorado & Southern, has had his jurisdiction extended to include the Denver & Salt Lake, with headquarters at Denver, Colo., succeeding **A. L. Cochrane**.

The jurisdiction of **A. S. McKelligan**, general storekeeper of the Southern Pacific, with headquarters at San Francisco, Cal., has been extended over the Western Pacific, the Tidewater Southern, and the Deep Creek.

L. B. Wood, purchasing agent and general storekeeper of the Southern Pacific, Texas Lines, has been appointed general storekeeper of all lines under W. B. Scott, federal manager, with headquarters at Houston, Tex.

H. E. Dutton, purchasing agent of the Green Bay & Western, has been appointed purchasing agent also of the Kewanee, Green Bay & Western, the Ahnapee & Western and the Waupaca-Green Bay, with headquarters at Green Bay, Wis.

F. W. Taylor, purchasing agent of the Southern Pacific Company, at San Francisco, Cal., has been appointed purchasing agent of the Southern Pacific system, lines south of Ashland, Ore., the Western Pacific, the Tidewater Southern, and the Deep Creek.

Special

J. S. Webster has been appointed chief special agent of all lines under the jurisdiction of W. B. Scott, federal manager, with headquarters at Houston, Tex.

Corporate

Executive, Financial, Legal and Accounting

Charles I. Sturgis, general auditor of the Chicago, Burlington & Quincy, has been appointed controller with office at Chicago.

A. E. Wright, secretary and purchasing agent of the St. Louis & O'Fallon, has been appointed secretary and assistant to the president, with headquarters at St. Louis, Mo.

E. T. Dumble has been appointed corporate manager in charge of the fuel oil department of the Southern Pacific Lines in Louisiana and Texas, with headquarters at Houston, Tex.

C. E. Bahl has been elected secretary and treasurer, and **W. B. Johnson** has been appointed auditor, of the Wheeling & Lake Erie and the Lorain & West Virginia; both with offices at Cleveland, Ohio.

E. S. Loucke has been appointed secretary and acting treasurer, of the Louisville & Nashville, and **G. R. White**, assistant auditor of disbursements, has been appointed auditor; both with offices at Louisville, Ky.

J. H. R. Parsons, vice-president and general manager of the Southern Pacific, Louisiana Lines, has been elected vice-president of the Southern Pacific Lines in Louisiana and Texas, with jurisdiction over the Louisiana Lines only, with headquarters at New Orleans, La.

George C. Morris, receiver of the Houston & Brazos Valley, has been appointed also treasurer, with headquarters at Freeport, Tex., to succeed **W. C. McLendon**, who has been appointed local treasurer under federal control. **A. E. Masterson** has been appointed general attorney for the receiver, with headquarters at Angleton, Tex.

G. L. King, assistant secretary of the Southern Pacific, Pacific System, has been appointed assistant treasurer, assistant secretary and secretary of leased lines of the Southern Pacific Lines West of El Paso and Ogden, with headquarters at San Francisco, Cal. **A. D'Heur** has been appointed corporate manager of the fuel and oil department, and **E. B. Leavitt** has been appointed lease agent, with headquarters at San Francisco, Cal.

C. J. Hellerstedt, assistant secretary of the Arizona & Eastern, has been appointed secretary with headquarters at Tucson, Ariz., succeeding Hugh Neill, who has been appointed assistant secretary, with headquarters at New York. **J. E. White**, assistant treasurer, has been promoted to treasurer, with headquarters at Tucson, succeeding **A. K. Van Deventer**, who has been appointed assistant treasurer at New York. **W. F. Bull**, assistant secretary of the Southern Pacific, Pacific System, has been appointed assistant secretary of the Arizona & Eastern, with headquarters at New York.

Edward M. Hyzer, vice-president and general counsel of the Chicago, St. Paul, Minneapolis & Omaha, has been appointed general counsel of that company, with headquarters at Chicago. **John D. Caldwell**, secretary, becomes secretary and assistant treasurer under the corporate organization, with headquarters at Chicago. **L. A. Robinson**, controller of the Chicago & North Western, has been appointed controller of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at Chicago. **George W. Bell**, land commissioner of the Omaha, has been appointed land commissioner and assistant secretary under the corporate organization, with headquarters at Hudson, Wis.

H. H. Hoar has been appointed assistant treasurer of the Kansas City Southern and the Arkansas Western succeeding **H. Visscher** and **I. C. McGee**, now respectively local treasurer and assistant treasurer of the Kansas City Southern under the United States Railroad Administration. **A. H. Barnes** has been appointed auditor of the Kansas City Southern succeeding **L. J. Hensley** who is now general auditor under the United States Railroad Administration. **R. J. McCarty**, vice-president of the Kansas City Southern, has been elected also president of the Arkansas Western. The other corporate officers are **R. S. Robertson**, vice-president; **J. C.**

Gardner, secretary and treasurer, and **J. M. Souby**, assistant secretary who is also solicitor and assistant secretary of the Kansas City Southern.

Operating

E. A. Murphy has been appointed general manager of the California & Oregon Coast, succeeding **J. D. MacVicar**, resigned to accept service elsewhere, effective September 1.

Traffic

W. J. McDonald has been appointed transfer agent of the Louisville & Nashville, with office at New York.

Rowland F. Hill, whose appointment as general freight and passenger agent of the Toronto, Hamilton & Buffalo, with headquarters at Hamilton, Ont., has already been announced in these columns, was born on December 14, 1889, at Hamilton, Ont. He began railway work in July, 1906, as a stenographer in the master mechanic's office of the Toronto, Hamilton & Buffalo. The following September he was transferred in the same capacity to the general freight and passenger agent's office. From September, 1909, to November, 1911, he was soliciting freight agent, and then to May, 1915, was rate clerk. He then served as chief clerk until September 15, 1915, when he was appointed assistant general freight and passenger agent, which position he held at the time of his recent appointment as general freight and passenger agent of the same road, as above noted. Mr. Hill's entire railroad service has been with the Toronto, Hamilton & Buffalo.

Engineering and Rolling Stock

Albert W. Newton has been appointed chief engineer of the Chicago, Burlington & Quincy, for the corporation, with headquarters at Chicago.

R. Montfort, consulting engineer of the Louisville & Nashville, has been appointed chief engineer for the corporation with headquarters at Louisville, Ky.

A. McDonald, assistant master mechanic of the Grand Trunk at Montreal, Que., has been appointed assistant to superintendent of motive power with office at Montreal shops.

F. W. Mahl, director of purchases of the Southern Pacific-Pacific System at New York, has been appointed corporate mechanical engineer of the Southern Pacific Lines west of El Paso and Ogden, with headquarters at San Francisco, Cal.

E. R. Battley, master mechanic of the Grand Trunk, at Montreal, Que., has been appointed superintendent of motive power, eastern lines, with headquarters at Montreal. **D. J. McCuaig**, master mechanic at Toronto, has been appointed superintendent of motive power, Ontario lines, with office at Toronto; **G. M. Wilson**, master mechanic, at Montreal, locomotive shops, has been appointed superintendent of motive power shops, at Montreal; **J. C. Garden**, master mechanic at Battle Creek, Mich., locomotive shops, has been appointed superintendent of motive power shops, at Stratford, Ont. **J. Vass**, assistant master mechanic at Allandale, Ont., has been appointed assistant to superintendent of motive power, Ontario lines, with headquarters at Allandale, and **J. R. Leckie**, assistant master mechanic at London, has been appointed assistant to superintendent of motive power, Ontario lines, with headquarters at London.

Special

J. W. James, special representative under **J. M. Herbert**, formerly inter-regional director at St. Louis, has been temporarily assigned to make a study of physical properties and operations for the stockholders and receivers of the Denver & Salt Lake.

Obituary

A. B. Eldredge, president of the Duluth, South Shore & Atlantic, with office at Marquette, Mich., died on September 9, after a brief illness, at the Hotel Manhattan, New York.

M. V. Richards, commissioner of the agricultural and industrial department of the Southern Railway, with office at Washington, D. C., died at Atlantic City, N. J., on September 8.

Morley Donaldson, formerly vice-president and general manager of the Grand Trunk Pacific at Winnipeg, Man., died at Ottawa, Ont., on August 27, at the age of 65. Mr. Donaldson was born in Edinburgh, Scotland, and entered the service of the Canada Atlantic as chief draftsman in 1881, subsequently rising to the position of general superintendent. When that road was merged with the Grand Trunk in 1905 he was appointed general superintendent of the Ottawa division. In 1912 he was appointed vice-president and general manager of the Grand Trunk Pacific at Winnipeg, from which position he resigned about a year ago.

C. W. Van Buren, who was killed in an automobile accident on August 25, at Canajoharie, N. Y., as was mentioned in these columns last week, was born on October 18, 1867, in Rensselaer county, N. Y. He was educated in the common schools, later attending night school in New York City. In 1889, he began railway work on the New York Central & Hudson River, and served as a carpenter at the West Albany shops until 1891. He was then appointed foreman; and two years later was given charge of the car department work on the Adirondack division at Herkimer, N. Y. In 1896, he was transferred to Utica in charge of car department work on the Adirondack and Mohawk divisions of the same road and the West Shore. He entered the service of the Canadian Pacific in July, 1905, as general inspector on the lines east of Port Arthur. The following year he was appointed divisional car foreman of the eastern division, remaining in that position until July, 1909. He then served as master car builder, of the eastern lines of the same road, at Montreal until May, 1911, and then went to the Union Stock Yard & Transit Company, Chicago, as assistant general superintendent, remaining in that position until January, 1915, and was then appointed general foreman of the Milwaukee Refrigerator Transit & Car Company at Milwaukee, Wis. In April, 1915, he returned to the service of the Canadian Pacific as general master car builder, which position he held until the time of his death.

Robert Ellerslie Smith, general superintendent of motive power of the Atlantic Coast Line, with office at Wilmington, N. C., was instantly killed on August 25, as was announced in our issue of last week. Mr. Smith's death was caused by the accidental discharge of a rifle which he was cleaning and it is supposed that he was not aware that the rifle was loaded. He was born on February 11, 1862, at Reading, Pa., and graduated from Phillips Academy, Andover, Mass., in the class of 1882. He began railway work later in the same year as a machinist's apprentice on the Philadelphia & Reading. From 1855, to November of the following year, he was a draftsman on the Norfolk & Western, and



R. E. Smith

then to October, 1890, was foreman of the same road at Norfolk, Va. He subsequently served as road foreman of engines for about two years and from 1892, to January, 1896, was general foreman of the Lambert Point shops of the same road. In January, 1896, he entered the service of the Atlantic Coast Line, as fuel agent, and in February of the following year was appointed superintendent of motive power of the same road. From July, 1898, to March, 1905, he served as assistant to general manager and since that time has been general superintendent of motive power of the same road.